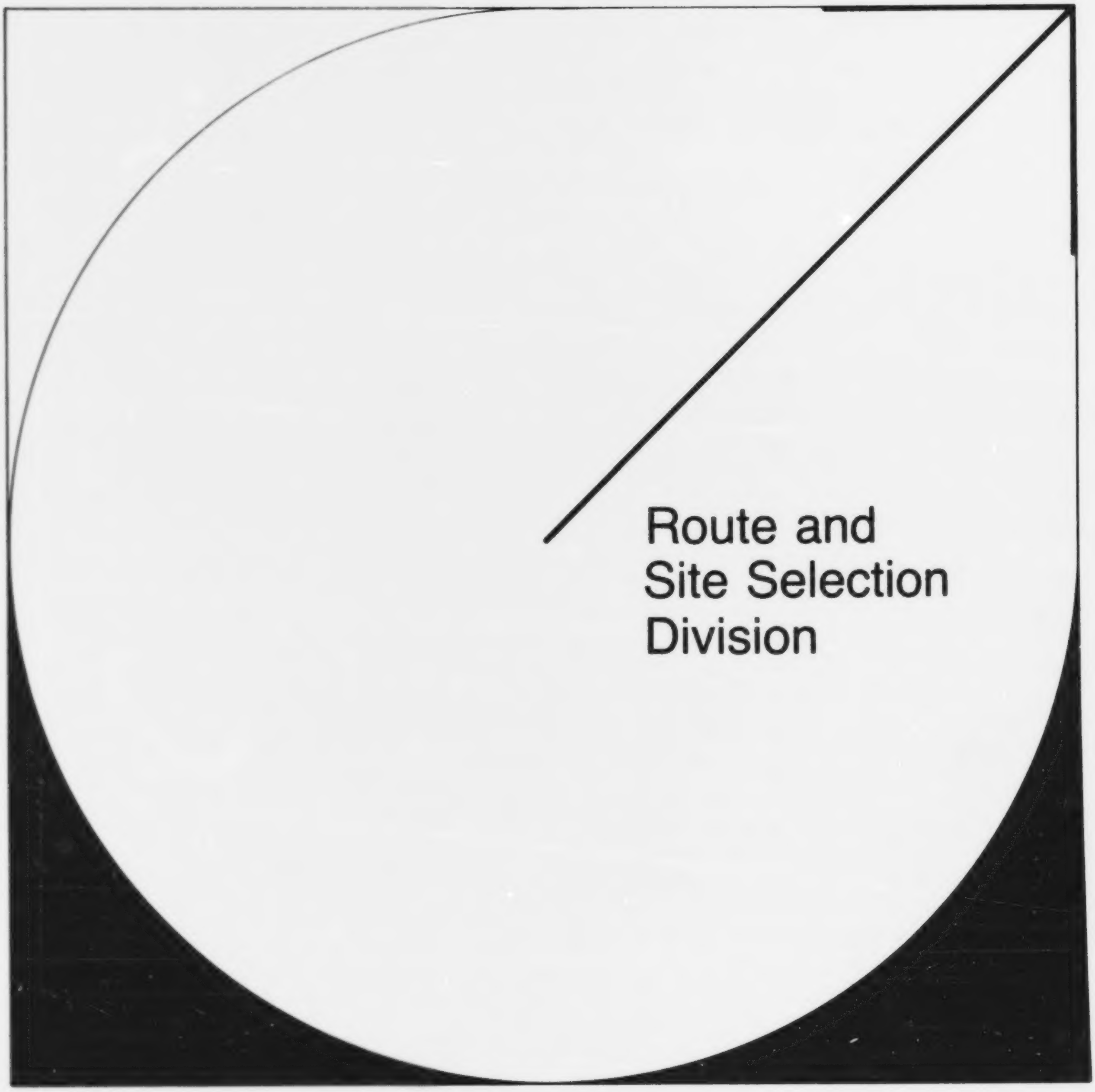
Eastern Ontario Transmission Line Study
Route Stage – Volume I
Environmental Assessment



Route and
Site Selection
Division

Eastern Ontario Transmission Line Study

Route Stage - Volume I

Environmental Assessment

August, 1984

Report No: 84096

August, 1984

EASTERN ONTARIO TRANSMISSION STUDY

ROUTE STAGE - VOLUME I

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1.0 INTRODUCTION

The Environmental Assessment (EA) Report for the Route Stage has been prepared in three volumes.

Volume I – covers those aspects of the study which are common to both the proposed transmission lines and telecommunications facilities between Lennox Generating Station (GS) and Hawthorne Transformer Station (TS), and the transmission line and telecommunications facilities between Hawthorne TS and St. Lawrence TS. It also includes a description of the undertaking, an update of the need for the proposed facilities, an update on alternatives and a description of the proposed facilities.

Volume II – describes the study to select the preferred route for two single-circuit 500 kV lines from Lennox GS to Hawthorne TS and sites for associated telecommunications facilities (West Section).

Volume III – describes the study to select the preferred route for one single-circuit 500 kV line from Hawthorne TS to St. Lawrence TS and sites for associated telecommunications facilities (East Section). This volume will be available in early 1985.

1.1 Plan Stage

Plan Stage studies were undertaken to determine the most acceptable plan for the supply of electrical energy in eastern Ontario and to allow exchanges of up to 2000 MW with Hydro-Quebec. A number of alternatives were identified and evaluated. A recommended plan was selected and submitted for review and approval under the Environmental Assessment Act in July, 1980, and subsequently for approval under the Consolidated Hearings Act, 1981, in August 1981.

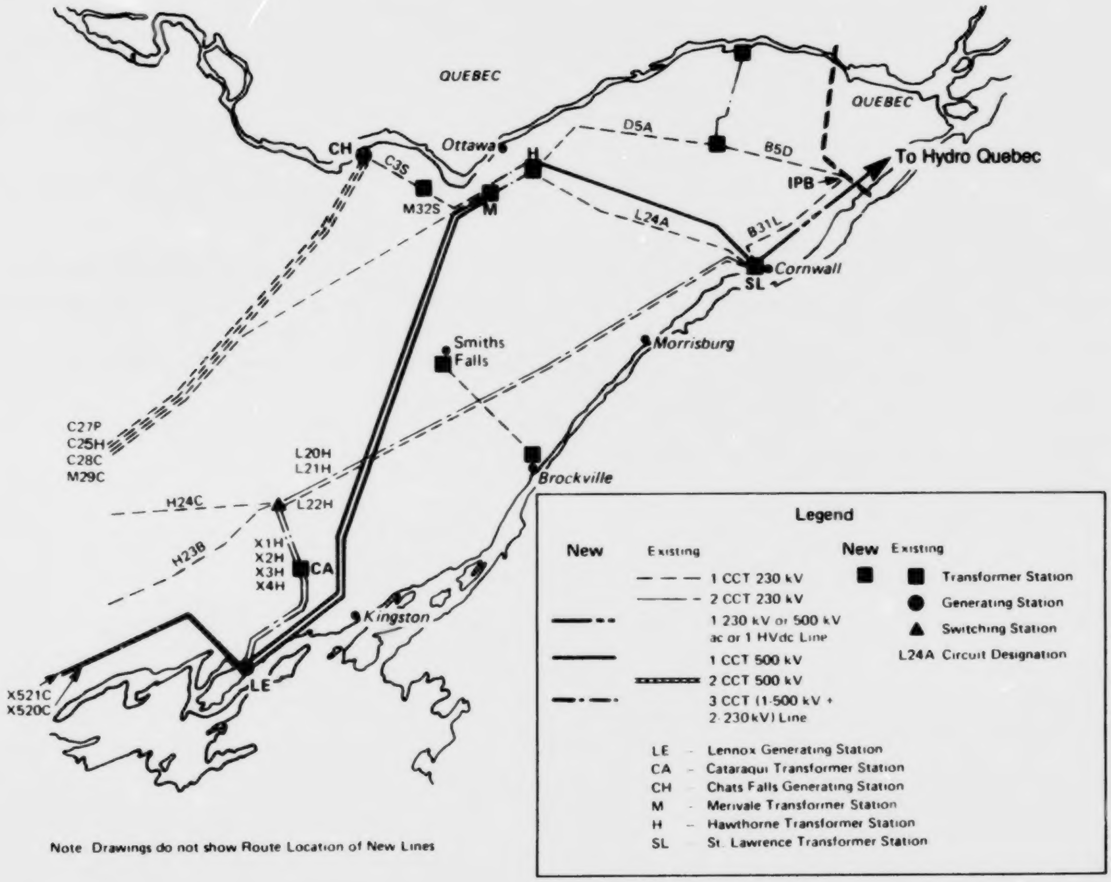
The recommended system plan identified the terminal points for the new transmission lines, the voltage and number of circuits required between the terminal points and a general study area for locating the transmission line routes. It also described the associated transformer station and telecommunications facilities.

Public hearings under the Consolidated Hearings Act were held in January, May and June, 1982 before the Joint Board. These hearings, held mostly in Ottawa, examined the need for the new facilities, alternative ways to meet the need and Ontario Hydro's recommended plan. On September 28, 1982, the Joint Board issued its decision approving the alternative system plan designated as Plan M3 (refer to Figures 1.1 and 1.2).

The Joint Board decision is appended to this report in Appendix A.

1.2 Route Stage

Following the Joint Board's decision, Ontario Hydro initiated studies to select routes and microwave radio station sites which were technically, economically and environmentally acceptable to accommodate the required facilities. These studies were conducted in conjunction with a programme of public involvement and were divided into two segments – the West Section (Lennox GS to Hawthorne TS) and the East Section (Hawthorne TS to St. Lawrence TS and the interconnection). This is illustrated in Figure 1.3.


QUEBEC
QUEBEC
To Hydro Quebec
Ottawa
CH
C3S
M32S
M
H
D5A
B5D
IPB
L24A
B31L
Cornwall
SL
Smiths Falls
Morrisburg
Brockville
Kingston
LE
CA
C27P
C25H
C28C
M29C
L20H
L21H
H24C
L22H
H23B
X1H
X2H
X3H
X4H
X521C
X520C
Legend
New
Existing
1 CCT 230 kV
2 CCT 230 kV
1 230 kV or 500 kV ac or 1 HVdc Line
1 CCT 500 kV
2 CCT 500 kV
3 CCT (1-500 kV + 2-230kV) Line
New
Existing
Transformer Station
Generating Station
Switching Station
L24A Circuit Designation
LE - Lennox Generating Station
CA - Cataraqui Transformer Station
CH - Chats Falls Generating Station
M - Merivale Transformer Station
H - Hawthorne Transformer Station
SL - St. Lawrence Transformer Station

Note Drawings do not show Route Location of New Lines

The approved plan (2000 stage) illustrated above comprises the following.

A) STATIONS

1) Lennox GS	– 500 kV switching facilities.
2) Hawthorne TS	– A 500 230 kV switching and transformer station in the Ottawa area at the existing Hawthorne TS site.
3) Merivale TS	– Provision for a 500 230 kV switching and transformer station in the Ottawa area at the existing Merivale TS site.
4) St. Lawrence TS	– A 500 230 kV switching and transformer station in the Cornwall area at the existing St. Lawrence TS site.
5) Other	– An extension of the Ontario Hydro microwave communication system linking stations in eastern Ontario.

B) LINES

1) Lennox GS to Merivale TS	– Two single-circuit 500 kV lines.
2) Merivale TS to Hawthorne	– The minimum requirements for this link are: - Two 500 kV circuits on separate tower lines. - Four 230 kV circuits. Except for some short sections, these requirements can be accommodated on the existing right of way by removing the existing circuits and installing two three-circuit tower lines, each with one 500 kV circuit and two 230 kV circuits. If in the route stage it is determined that the right of way can be widened, other arrangements may be considered.
3) Hawthorne TS to St. Lawrence TS	– One single-circuit 500 kV line.

Figure 1.1
The Approved Plan (M3)

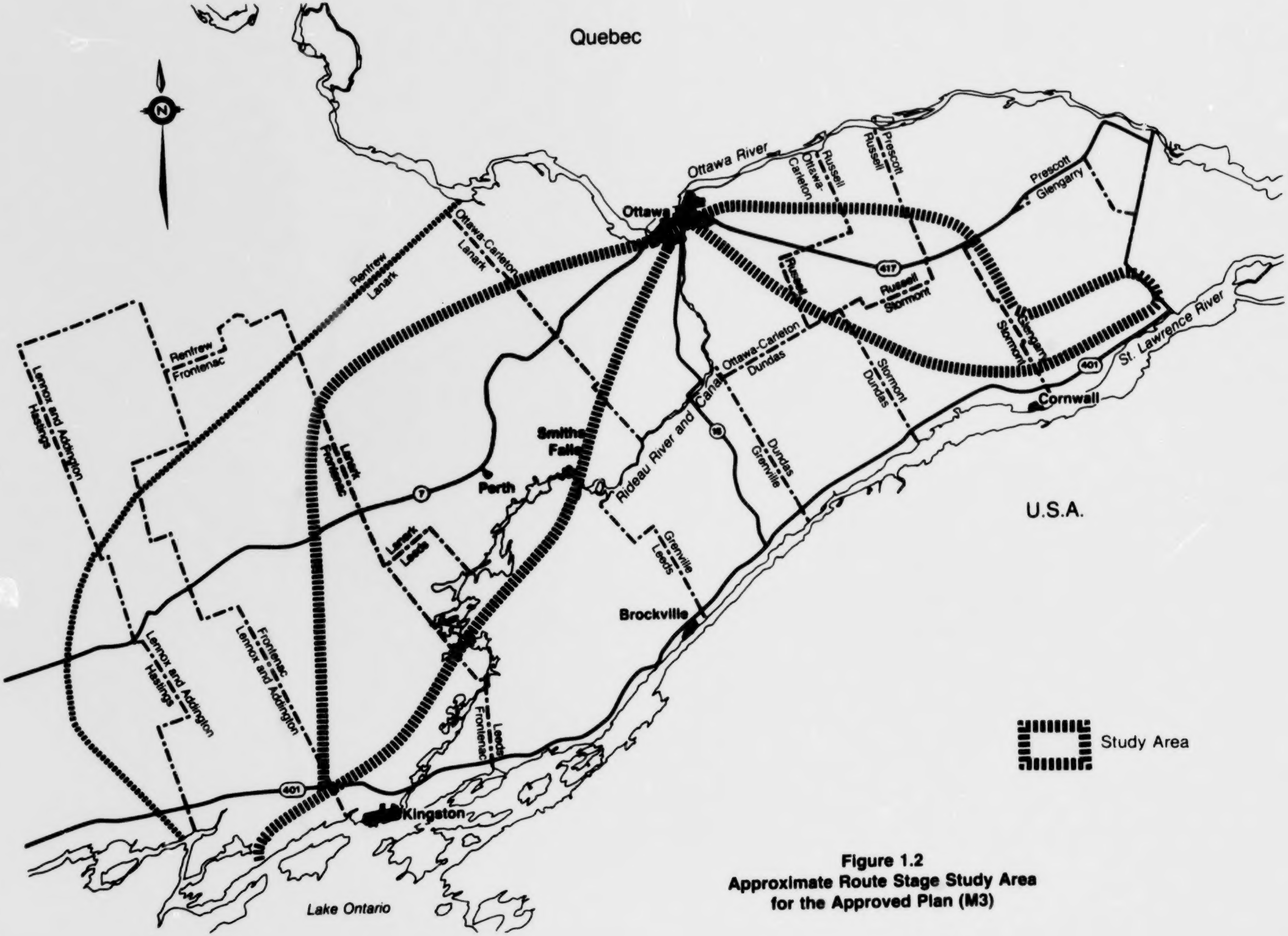

Quebec
N
Ottawa River
Ottawa
Russell
Ottawa-Carleton
Prescott
Russell
Prescott
Glengarry
417
Russell
Russell
Stormont
Glengarry
Stormont
St. Lawrence River
401
Cornwall
Ottawa-Carleton
Lanark
Renfrew
Lanark
Renfrew
Frontenac
Ottawa-Carleton
Dundas
Stormont
Dundas
Rideau River and Canal
Smiths Falls
Perth
7
Dundas
Grenville
U.S.A.
Lennox and Addington
Hastings
Lanark
Frontenac
Lanark
Leeds
Grenville
Leeds
Brockville
Frontenac
Lennox and Addington
Lennox and Addington
Hastings
Leeds
Frontenac
401
Kingston
Lake Ontario
Study Area

Figure 1.2
Approximate Route Stage Study Area
for the Approved Plan (M3)

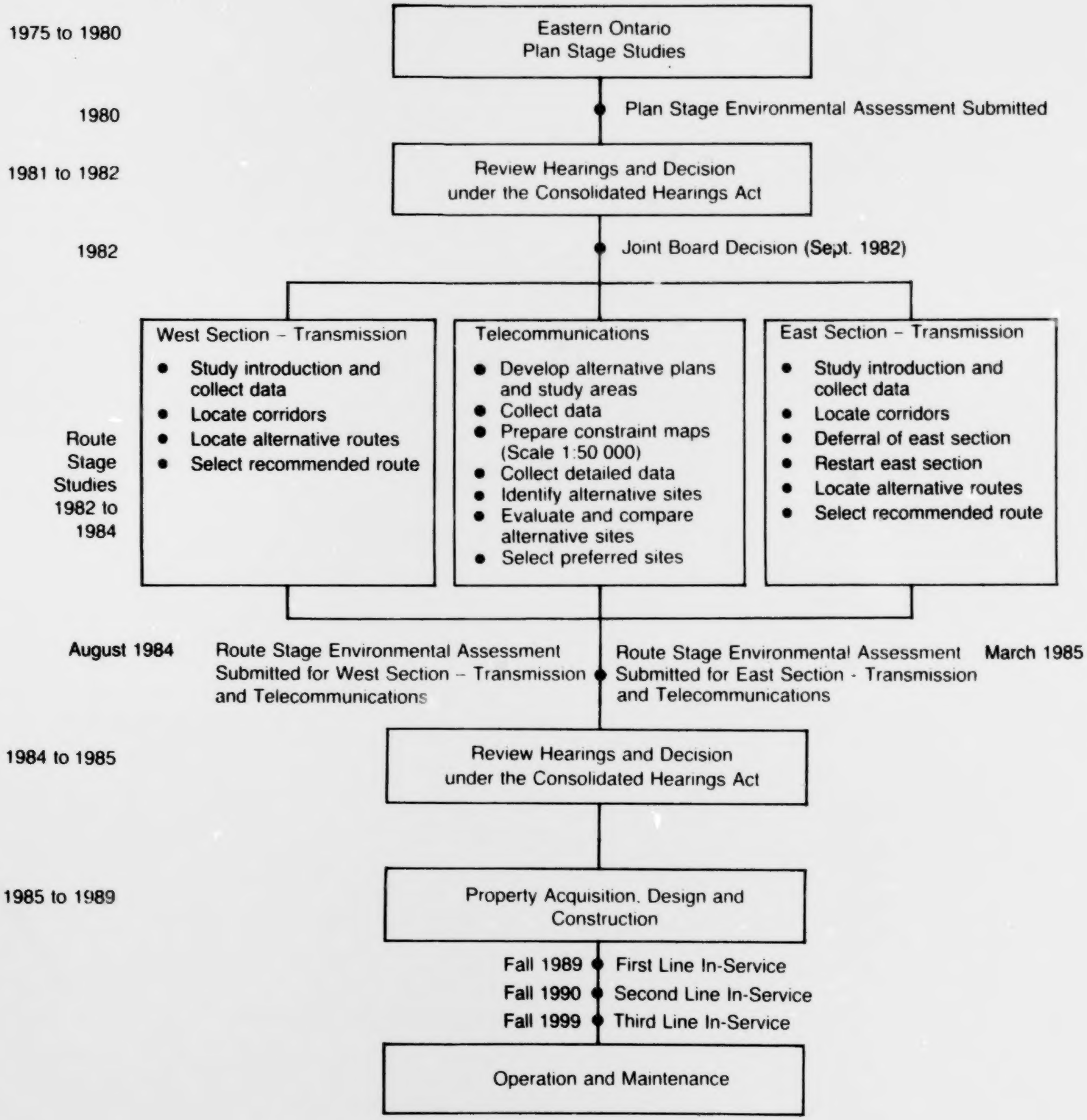

1975 to 1980
Eastern Ontario Plan Stage Studies
1980
Plan Stage Environmental Assessment Submitted
1981 to 1982
Review Hearings and Decision under the Consolidated Hearings Act
1982
Joint Board Decision (Sept. 1982)
Route Stage Studies 1982 to 1984
West Section – Transmission
Study introduction and collect data
Locate corridors
Locate alternative routes
Select recommended route
Telecommunications
Develop alternative plans and study areas
Collect data
Prepare constraint maps (Scale 1:50 000)
Collect detailed data
Identify alternative sites
Evaluate and compare alternative sites
Select preferred sites
East Section – Transmission
Study introduction and collect data
Locate corridors
Deferral of east section
Restart east section
Locate alternative routes
Select recommended route
August 1984
Route Stage Environmental Assessment Submitted for West Section – Transmission and Telecommunications
Route Stage Environmental Assessment Submitted for East Section - Transmission and Telecommunications
March 1985
1984 to 1985
Review Hearings and Decision under the Consolidated Hearings Act
1985 to 1989
Property Acquisition. Design and Construction
Fall 1989
First Line In-Service
Fall 1990
Second Line In-Service
Fall 1999
Third Line In-Service
Operation and Maintenance

Figure 1.3
Project Life Cycle of Eastern Ontario
Plan and Route Stage Studies

RS 164-LUEP-RA6-0046

1.3 Interconnection with Hydro-Quebec

Ontario Hydro's original application included facilities to deliver to and receive from an interconnection with Hydro-Quebec about 2000 MW of electric power, for the mutual benefit of Ontario and Quebec.

In April, 1984, the growing urgency in the need for new transmission to ensure reliable power supply to the Ottawa area and further concern as to the completion of the interconnection assessment prompted Ontario Hydro to seek the removal of the interconnection from the purpose of the undertaking. The Joint Board heard Ontario Hydro's evidence on this motion at hearings in May and June, 1984 and granted approval to delete the interconnection purpose from the undertaking on June 29, 1984. A copy of the text of their decision is found in Appendix B.

It was stated in Ontario Hydro's evidence at the May/June 1984 hearing on this motion that the interconnection study would be separated from the supply of eastern Ontario loads. Depending on the outcome of joint studies with Hydro-Quebec, it would be considered under a separate environmental approval process. If available, the conclusions of the technical studies with Hydro-Quebec will be provided at the route stage hearings.

1.4 Deferral of East Section

The Joint Board also approved in their decision of June 29, 1984, the deferral of all hearings on the approval of the location for the East Section facilities to a further public hearing. It is anticipated that this hearing will be held in the summer of 1985.

Line
Numbers

Line
Numbers

2.0 PURPOSE OF THE UNDERTAKING

2.1 General Purpose

The general purpose of the undertaking is to continue to provide a reliable supply of electric power and energy to the people of Ontario at the lowest feasible cost consistent with employee and public safety, taking into account the social, environmental and economic aspirations of the people of Ontario.

2.2 Specific Purpose

Consistent with Section 2.1, the specific purpose of the undertaking is to provide for the supply of electric power and energy to meet the load growth now forecast to occur in eastern Ontario to the year 2000.

Line
Numbers

Line
Numbers

3.0 THE UNDERTAKING

The undertaking, for which approval is requested pursuant to the Plan Stage approval granted by the Joint Board in its decision, dated August 6, 1982, is a transmission system project consisting of the planning of, the selection of locations for, the acquisition of property rights for, and the design, construction, operation and maintenance of additional bulk electricity system facilities in eastern Ontario, consisting of switching and transformer stations, telecommunication and control facilities, transmission lines and related facilities.

The purpose of the undertaking can be fulfilled by various alternative transmission line routes and microwave radio station sites. The alternative route and sites preferred by Ontario Hydro for the West Section and recommended for approval, is set out in Volume II. The alternative route and sites preferred by Ontario Hydro for the East Section and recommended for approval will be set out in Volume III to be filed in early 1985.

Line
Numbers

4.0 THE LOAD FORECAST

During the 1982 Plan Stage hearings, evidence was presented by Ontario Hydro with respect to the 1982 planning load forecast for Ontario in general and for the Ottawa area in particular. Evidence with respect to the latest forecast (1984) was presented at the interconnection and deferral hearings, held in Ottawa in May and June of 1984. The 1985 planning forecast for Ontario will be available in late 1984 and will be presented at the January route stage hearings.

4.1 General

The 1984 planning load forecast of electrical load growth in the Province of Ontario indicates the most likely growth rate to be in the order of 2.5 percent per annum to the year 2000.

The major assumptions in the 1984 planning forecast are:

(i) Real economic growth in Ontario will average about 2.5 percent per year.

(ii) The Ontario population in the year 2000 will be 9.95 million, of which 5.56 million will be in the labour force.

(iii) The price of electricity will decline relative to wages and to oil and gas prices and over the longer period remain roughly constant in real terms.

(iv) Ontario Hydro marketing programs will add about 570 average MW to the Ontario system load by 1990.

(v) The rate of technical progress will recover from its recent negative values to a level below the average of the 1960's but above the average of the last decade.

(vi) The stability of social, economic and financial institutions will be retained. No international financial crisis will seriously affect the Canadian financial system.

4.2 Eastern Ontario and the Ottawa Area

Although the transmission facilities in Plan M3 are required to support the load in all of eastern Ontario, their timing is directly related to the load growth in the Ottawa area.

The eastern Ontario study area can be roughly described as the area east of a north-south line through Lennox GS near Kingston. The Ottawa area load includes that of Regional Municipality of the Ottawa - Carleton and others as far west as Almonte and Arnprior and as far east as Hawkesbury.

Historically, the eastern Ontario study area and the Ottawa area in particular have had higher rates of electrical load growth than Ontario as a whole. This trend which is expected to continue during the study period, can be attributed partly to the fact that Ottawa is the nation's capital, partly to the growth in "high-tech" industries in the Ottawa Valley, and partly to the locally wide acceptance of government programmes and incentives designed to promote development, such as the Ontario Government BILD programme, and the Federal Government oil substitution (COSP) programme.

Figures 4.1 and 4.2 show the forecast January peak loads for eastern Ontario and the Ottawa area respectively. Figure 4.2 shows that based on the 1984 load forecast, the electrical load in the Ottawa area is expected to grow at an average rate of 3.1% to the year 2000. Also shown on Figure 4.2 are the actual peak loads in the 1981 to 1984 period and the 1982 forecast presented at the Plan Stage hearings. As illustrated, the actual peak load has been significantly higher than forecast. As well, the 1984 forecast of loads for the late 1980s to mid-1990s period is higher than the 1982 forecast.

As noted in Figure 4.2, the actual 1983/84 winter peak load in Ottawa was 1359 MW and occurred at 6:00 pm on January 16, 1984. Previously, the peak loads for the area were measured at the time of the peak load for the entire province. Recent improvements in data collection have made it possible to determine the Ottawa area peak load independent of the rest of the power system. As the Ottawa area peak load could have occurred non-coincident with the Eastern Region peak load in earlier years, demand in the Ottawa area may have been higher than the "actual" loads illustrated on that figure.

The effects of the revised load forecast on the timing of the facilities in Plan M3 are discussed in Chapter 5.0.

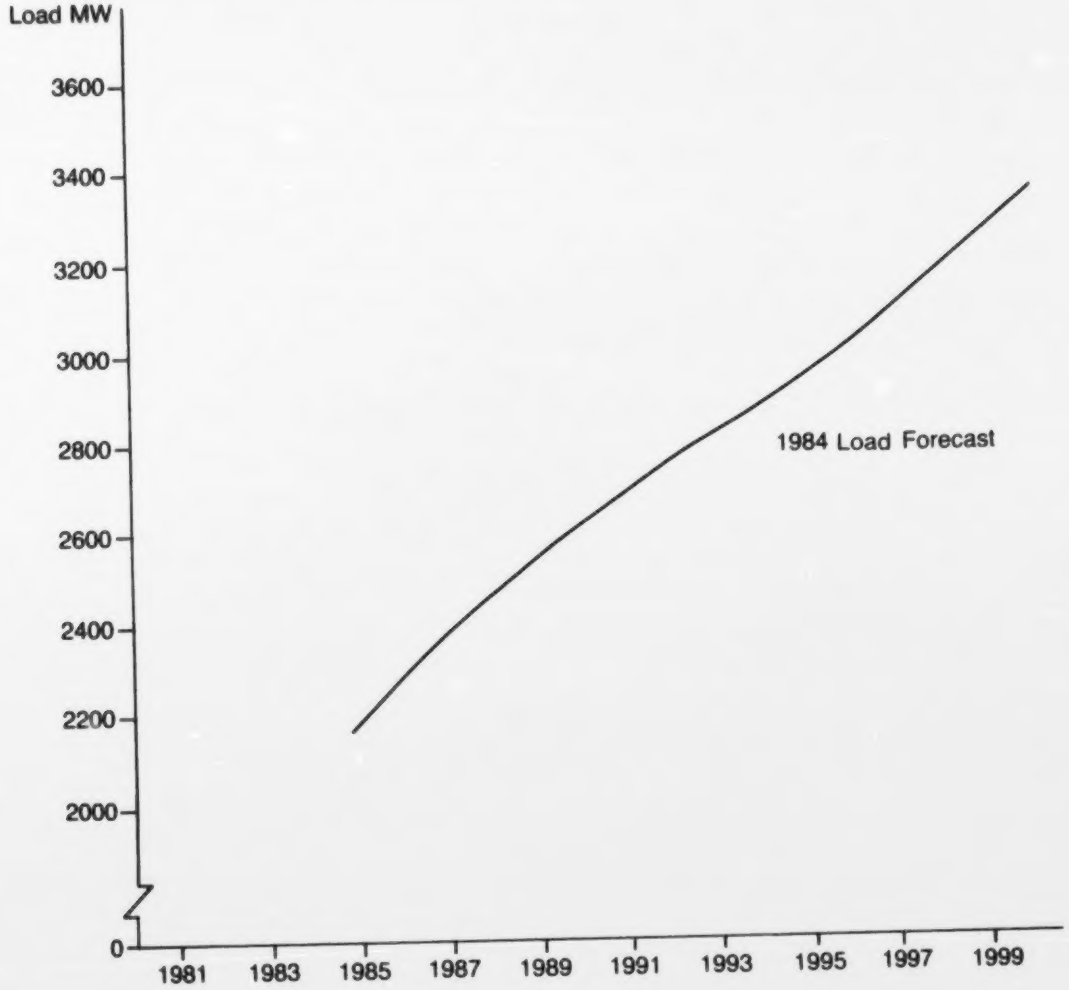


Figure 4.1
Eastern Ontario Sum of Customer
January Peak Loads

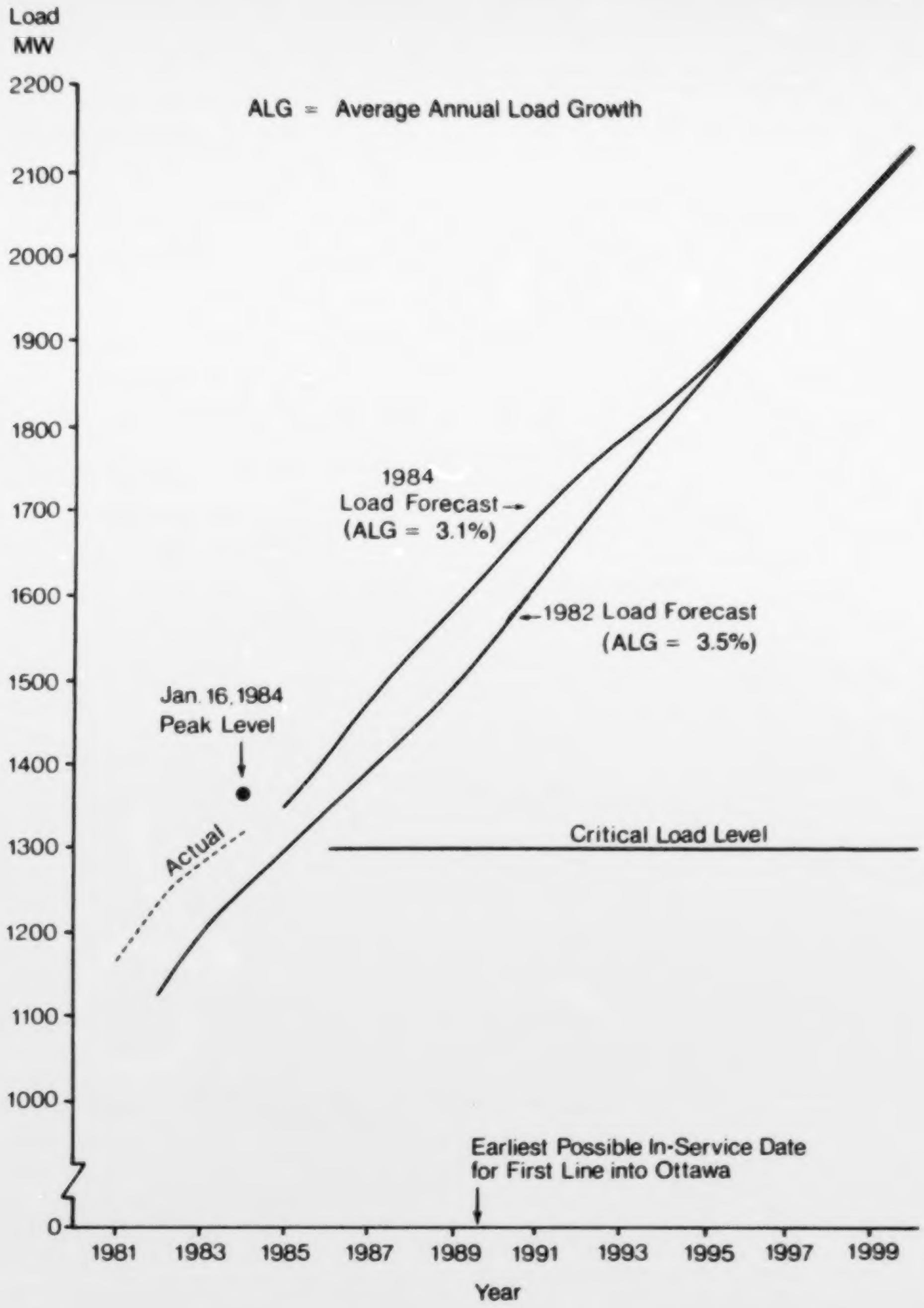


Figure 4.2
Ottawa Area Peak Loads

Line Numbers

5.0 SYSTEM REQUIREMENTS

5.1 The Existing Ontario Hydro System

The existing transmission system in eastern Ontario is shown in Figures 5.1 and 5.2. In its Plan Stage decision, the Joint Board recognized that the existing transmission system will be inadequate to reliably supply the forecast load in the Ottawa area by the early 1980s. Since the Plan Stage hearings, the only significant change to the requirement for the facilities is that they are now required more urgently than before.

The design criteria for the Ottawa area is based on the overlapping loss of the two most critical transmission lines supplying this area. For this situation acceptable voltages and circuit loading conditions must be maintained without the loss of customer load. Based on this criteria, the existing system is capable of reliably delivering approximately 1,300 MW of power to the Ottawa area.

The supply to the Ottawa area is now critical. However, if this problem is not corrected, eventually the supply to Smith Falls, Perth, Brockville and the St. Lawrence area, will also be in jeopardy. If no additional facilities are in service by the early to mid-1990s, the critical load area would extend over nearly all of the eastern Ontario study area.

5.2 Timing of New Transmission Facilities

The timing for the new transmission facilities in eastern Ontario was presented at the Plan Stage hearings.

The following information summarizes and updates that information. The specific nature of the Plan M3 facilities, including configuration, length, voltage, and termination point will be discussed in Volumes II and III.

5.2.1 The First 500 kV Line

As discussed in Section 4.2, the first line to the Ottawa area is required as soon as possible since the peak load in the Ottawa area has already exceeded the 1300 MW critical load level.

5.2.2 The Second 500 kV Line

After the first line is placed in service, the transmission system will be capable of reliably supplying about 1700 MW of load in the Ottawa area. This assumes the same criteria as stated in Section 5.1.

Based on the 1984 planning load forecast the Ottawa area load is expected to reach 1700 MW during the peak load period of the winter of 1990/1991. Therefore, the second line should be placed in service not later than the Fall of 1990.

5.2.3 The Third 500 kV Line

With two 500 kV circuits in service into the Ottawa area the capability of the system will be approximately 2100 MW. The Ottawa area load is forecast to reach this level during the winter of 1999/2000. Therefore, the third 500 kV line should be placed in service not later than 1999. This will require commencement of engineering, survey and construction activities in the mid-1990s.

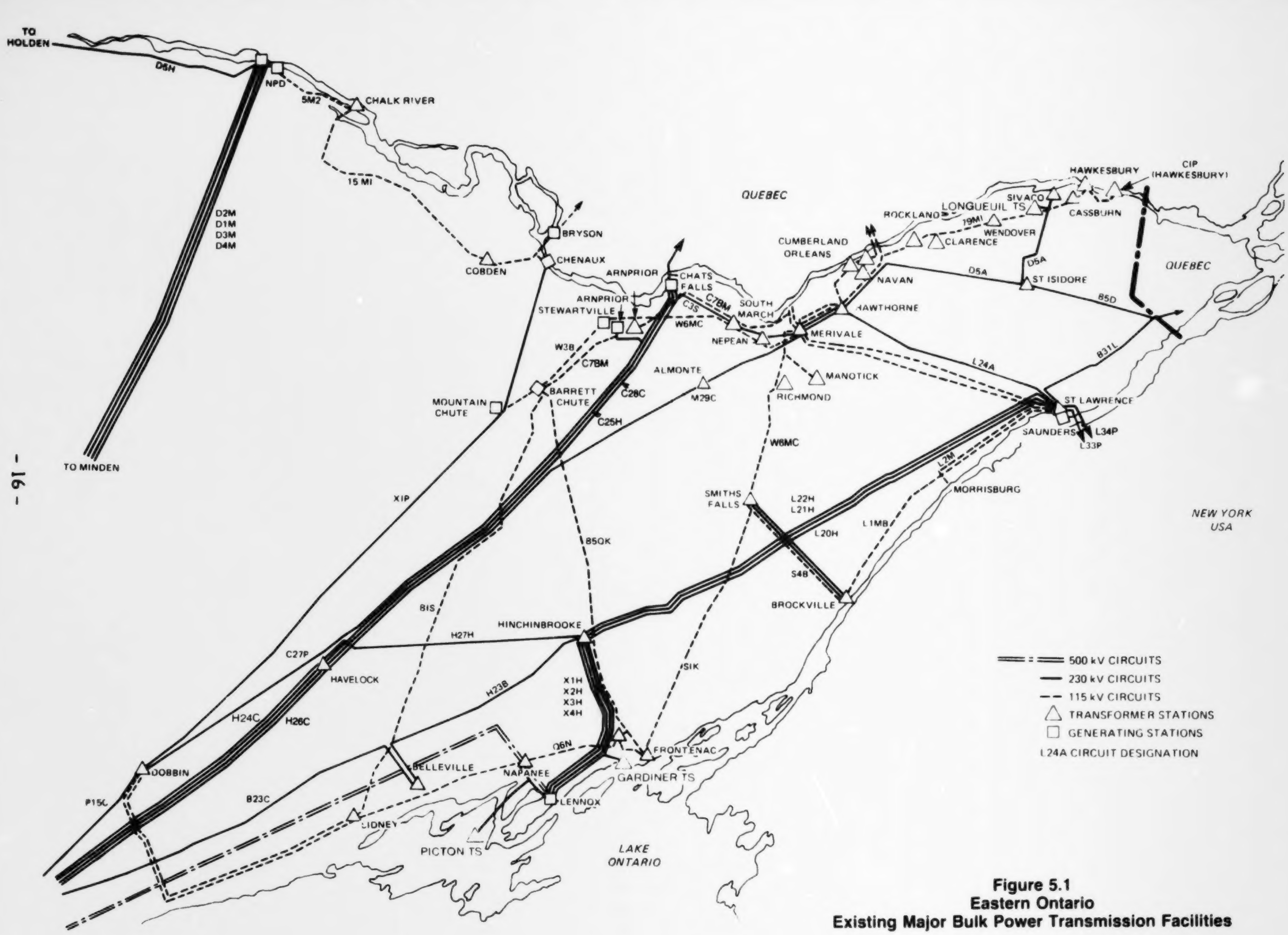

TO HOLDEN
D5H
NPD
5M2
CHALK RIVER
15 MI
D2M
D1M
D3M
D4M
TO MINDEN
QUEBEC
BRYSON
CHENAUX
COBDEN
ARNPRIOR
ARNPRIOR
CHATS FALLS
STEWARTVILLE
C3S
C7BM
W6MC
SOUTH MARCH
NEPEAN
MERIVALE
W3B
C7BM
BARRETT CHUTE
C28C
C25H
MOUNTAIN CHUTE
ALMONTE
M29C
MANOTICK
RICHMOND
W6MC
CUMBERLAND
ORLEANS
NAVAN
HAWTHORNE
ROCKLAND
LONGUEUIL TS
19MI
CLARENCE
WENDOVER
SIVACO
HAWKESBURY
CASSBURN
CIP (HAWKESBURY)
D5A
D5A
ST ISIDORE
85D
QUEBEC
L24A
B31L
ST LAWRENCE
SAUNDERS
L34P
L33P
L2M
MORRISBURG
NEW YORK USA
XIP
SMITHS FALLS
L22H
L21H
L20H
L1MB
S48
BROCKVILLE
85QK
BIS
HINCHINBROOKE
H27H
C27P
HAVELOCK
H23B
SIK
X1H
X2H
X3H
X4H
H24C
H26C
DOBBIN
P15C
B23C
BELLEVILLE
NAPANEE
Q6N
FRONTENAC
GARDINER TS
LENNOX
SIDNEY
PICTON TS
LAKE ONTARIO
500 kV CIRCUITS
230 kV CIRCUITS
115 kV CIRCUITS
TRANSFORMER STATIONS
GENERATING STATIONS
L24A CIRCUIT DESIGNATION

Figure 5.1
Eastern Ontario
Existing Major Bulk Power Transmission Facilities

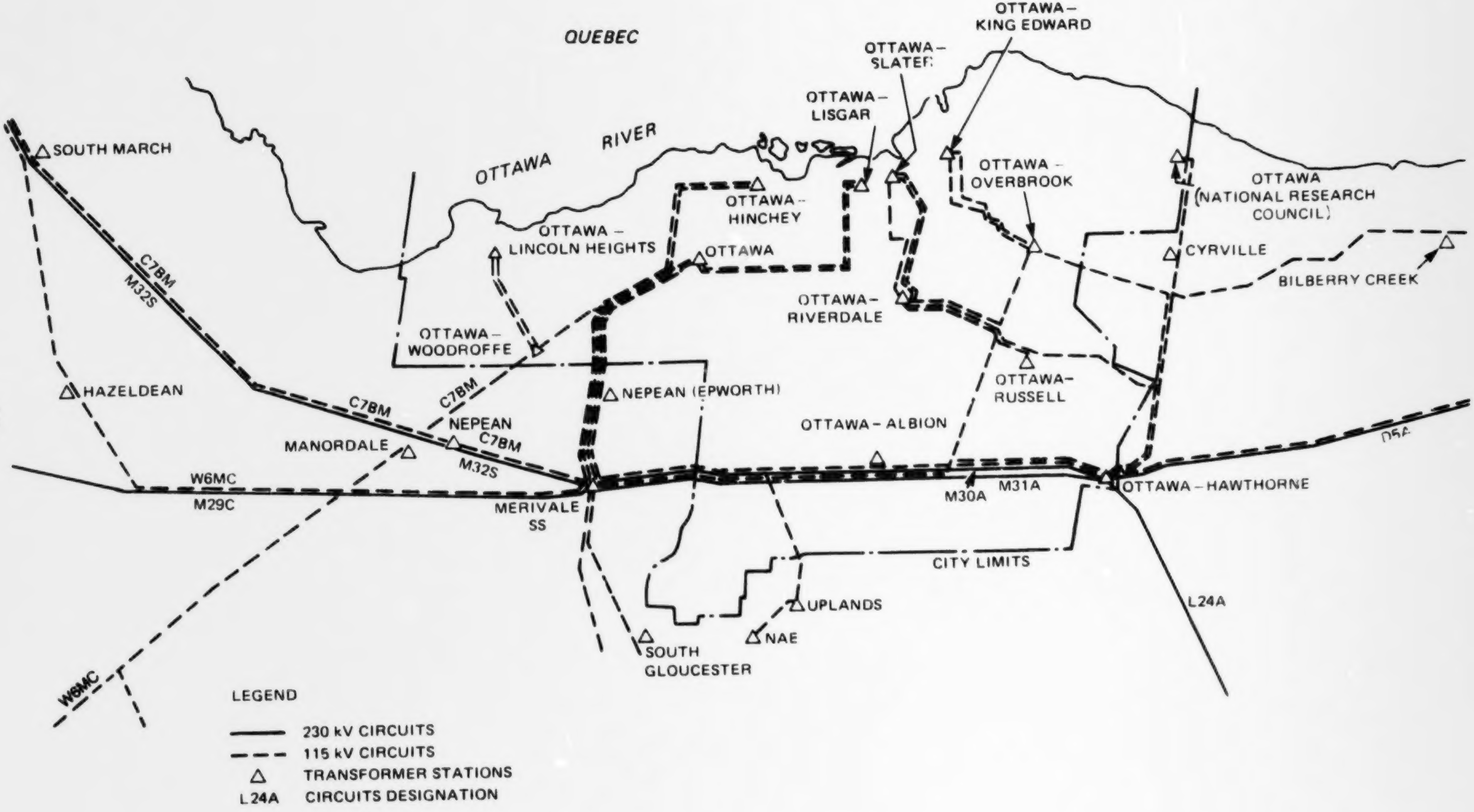

QUEBEC
OTTAWA RIVER
SOUTH MARCH
HAZELDEAN
C7BM
M32S
MANORDALE
NEPEAN
W6MC
M29C
MERIVALE SS
OTTAWA – WOODROFFE
OTTAWA – LINCOLN HEIGHTS
OTTAWA
OTTAWA-HINCHEY
NEPEAN (EPWORTH)
OTTAWA-LISGAR
OTTAWA-SLATER
OTTAWA-KING EDWARD
OTTAWA-OVERBROOK
OTTAWA-RIVERDALE
OTTAWA-RUSSELL
OTTAWA - ALBION
OTTAWA (NATIONAL RESEARCH COUNCIL)
CYRVILLE
BILBERRY CREEK
D5A
M30A
M31A
OTTAWA - HAWTHORNE
CITY LIMITS
L24A
UPLANDS
NAE
SOUTH GLOUCESTER
LEGEND
230 kV CIRCUITS
115 kV CIRCUITS
△ TRANSFORMER STATIONS
L24A CIRCUITS DESIGNATION

Figure 5.2
Ottawa and Vicinity
Major Bulk Power Transmission Facilities

It should be noted that the capability to supply the Ottawa area with the three 500 kV lines in service will be approximately 3000 MW.

5.2.4 Staging of Plan M3 Facilities

The timing of the new 500 kV transmission facilities associated with the approved Plan M3 is directly related to the requirement to supply the load in the Ottawa area, as described in Section 4.2. Based on the present load forecast, the three lines would be placed in service in 1989, 1990 and 1999.

It is essential that the first circuit to Hawthorne TS be from Lennox GS in order to connect the Ottawa area to the main Ontario bulk electric system west of Kingston.

The staging of the second and third 500 kV lines could be influenced by the outcome of the technical study on the interconnection with Hydro-Quebec. One possible scenario is a recommendation for an interconnection at St. Lawrence TS in the early 1990s. Under this scenario, the second line would be from St. Lawrence TS and the third line would be from Lennox GS. On the other hand, if there is to be no interconnection within the study period, the second line would be either from St. Lawrence TS or Lennox GS depending upon other factors.

If the second line is from St. Lawrence TS, the total cost of Plan M3 is estimated to be $293,000,000. If it is from Lennox GS, the cost is estimated to be $299,000,000.

5.3 Telecommunications Facilities

The facilities required for Plan M3 as approved by the Joint Board in its Plan Stage decision, included an expansion of Ontario Hydro's existing microwave telecommunication system into eastern Ontario.

Telecommunications facilities are required to effectively protect and control the bulk electricity system. The prime function of the telecommunications facilities is to provide high-speed isolation of faulted elements of this system. This is accomplished by transmitting information between line terminations to activate protective relays and rapidly isolate electrical transmission lines, transformers, generating units, and other power system elements during system faults. Telecommunications facilities are also used for remote control of stations, for automatic generation control of power generating machinery, and for acquisition of data for centralized monitoring and control.

As illustrated in Figure 5.3, the existing microwave radio telecommunications system extends eastward as far as the Hinchinbrooke Switching Station (SS). The proposed telecommunications system will require three microwave radio repeater stations between Hinchinbrooke SS and Hawthorne TS and one between Hawthorne TS and St. Lawrence TS, and terminal facilities at Hawthorne TS and St. Lawrence TS. Telecommunications facilities are required when the transmission lines go in service.

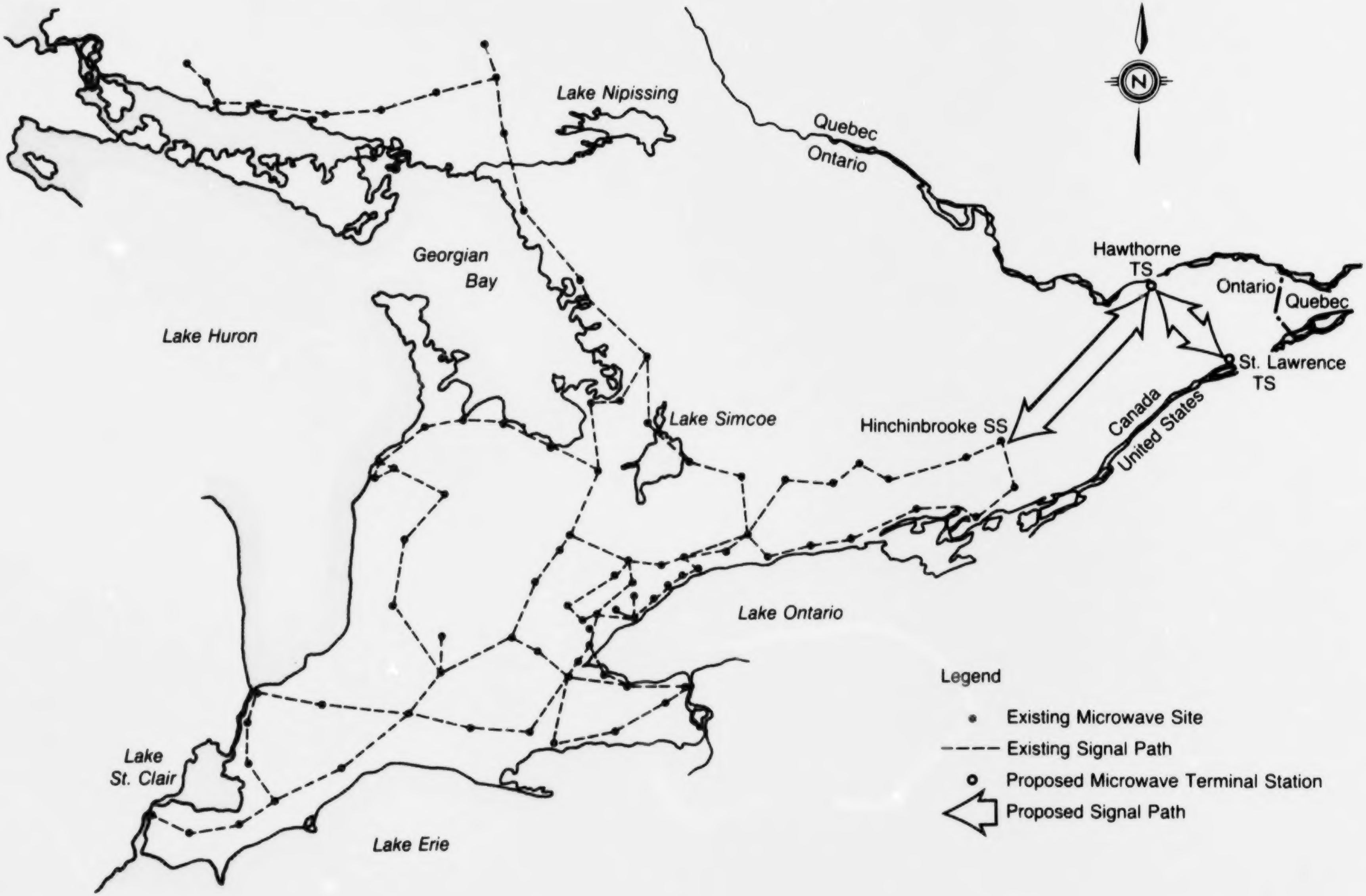

Lake Nipissing
Quebec
Ontario
Hawthorne TS
Ontario
Quebec
St. Lawrence TS
Georgian Bay
Lake Huron
Lake Simcoe
Hinchinbrooke SS
Canada
United States
Lake Ontario
Lake St. Clair
Lake Erie
N
Legend
● Existing Microwave Site
---- Existing Signal Path
○ Proposed Microwave Terminal Station
⇦ Proposed Signal Path

Figure 5.3

Existing and Proposed Telecommunication System

Line
Numbers

Line
Numbers

6.0 ALTERNATIVES

6.1 Alternatives to the Undertaking

6.1.1 Alternatives to Transmission

Ontario Hydro is continually studying alternatives in supplying the electrical needs of its customers. Alternatives to this undertaking were discussed in Section 10.0 of the Plan Stage Environmental Assessment and were set out in evidence before the Joint Board.

The Joint Board, in their September 28, 1982 Reasons for Decision, accepted Ontario Hydro's recommendation in the Plan Stage that additional bulk transmission facilities are the best alternative to satisfy the purposes of the undertaking. Since the Plan Stage hearings, there have been no significant developments which would alter that conclusion.

The following information addresses alternatives presented at the Plan Stage for which updated information is available.

(a) Cogeneration

The Plan Stage Environmental Assessment stated that the total amount of industrial and district heating cogeneration in the study area could be as high as 165 MW by the end of the century. This estimate, made in the late 1970s, is towards the upper bound that might be realized. The economic incentives to develop cogeneration are now less than in the late 1970s because electricity prices are not expected to increase in real terms, which slows down the development of industrial cogeneration. The cost of various space heating options are not forecast to increase as much as foreseen in the late 1970s, lessening the incentive for district heating developments. It is also worth noting that since the earlier assessment, no cogeneration facilities have been implemented in the Ottawa area.

(b) Biomass

A recent Ontario government study of the energy potential of wood in eastern Ontario indicates that the region is capable of producing a million tonnes of wood annually at a cost of $50/tonne. However, the use of energy plantations and biomass for generating electricity alone is generally less cost effective than other alternatives and opportunities.

(c) Power Purchases from Hydro-Quebec

Since the peak load period occurs in the winter months in both Quebec and Ontario, Hydro-Quebec would require surplus peak generating capacity to accommodate firm power sales to meet the needs of the Ottawa area load. Hydro-Quebec's most recent forecasts continue to indicate that they will not have surplus peak generating capacity beyond 1992.

6.1.2 Alternatives to Microwave

For the effective protection and control of the proposed 500 kV transmission facilities in eastern Ontario, microwave telecommunication facilities are required as the primary bearer medium.

During the route stage study, the public requested information on alternative telecommunication methods including power line carrier (PLC), fiber optics, leased or shared systems, and satelite controlled systems. These are described in Appendix C.

6.2 Alternative Methods of Carrying Out the Undertaking

6.2.1 Transmission

Ontario Hydro's bulk electrical transmission system consists of overhead alternating current (ac) transmission lines at either 230 kV or 500 kV. Alternative methods of bulk electrical transmission were considered at the Plan Stage. The Joint Board accepted Ontario Hydro's recommendation that overhead ac transmission be used in eastern Ontario. Since the Plan Stage hearings, there have been no significant developments which would alter that conclusion.

Based on the Plan Stage decision of the Joint Board, alternative routes for overhead ac transmission which would meet the purpose of the undertaking were identified and evaluated. These studies and the recommended route locations and set out in Volumes II and III of this Route Stage Environmental Assessment.

6.2.2 Telecommunications

Various alternative methods were examined for implementing the microwave telecommunication system and two were assessed in detail (refer to Appendix D). Option 1, involving a frequency diversity microwave radial system with a parallel PLC system and leased facilities, was selected for its economic and environmental advantages.

7.0 FACILITIES CONSIDERED

7.1 Transmission Lines

7.1.1 Lennox GS to Hawthorne TS

Two new single circuit 500 kV transmission lines are required from the switchyard at Lennox GS to Hawthorne TS. The two 500 kV lines will pass through the Merivale TS but no electrical connections at 500 kV will be made at this station in the study period.

Two additional 230 kV circuits will also be needed between Merivale TS and Hawthorne TS.

7.1.2 Hawthorne TS to St. Lawrence TS

A single circuit 500 kV transmission line is required to connect Hawthorne TS to St. Lawrence TS.

7.1.3 Tower Types

Various tower designs were investigated in the study. These are illustrated in Figures 7.1 to 7.7. The specific tower types that will be used will be determined after conducting a detailed design.

(a) Conventional Four Footing Wide Base Towers

- This tower would be used in most areas in eastern Ontario.

(b) V-guyed Structures

- These towers could be used in areas of rough terrain. They are not considered for agricultural land because the presence of guy-wires could interfere within mechanized farm equipment.

(c) Single footing narrow base towers

Agreement has been reached between Ontario Hydro and the Ontario Federation of Agriculture (OFA) regarding the use of single footing narrow base towers. Subject to technical requirements these towers will be used for straight-line open field crossings of cultivated land having soil capability of Class 1-4 and specialty crop land.

(d) Steel Poles

Fabricated steel pole structures as shown in Figures 7.4 and 7.5 will be considered under special circumstances. It is Ontario Hydro's practice to consider these towers for one or two circuits, where residential, commercial or industrial park areas are established or under construction, or where development plans have been approved.

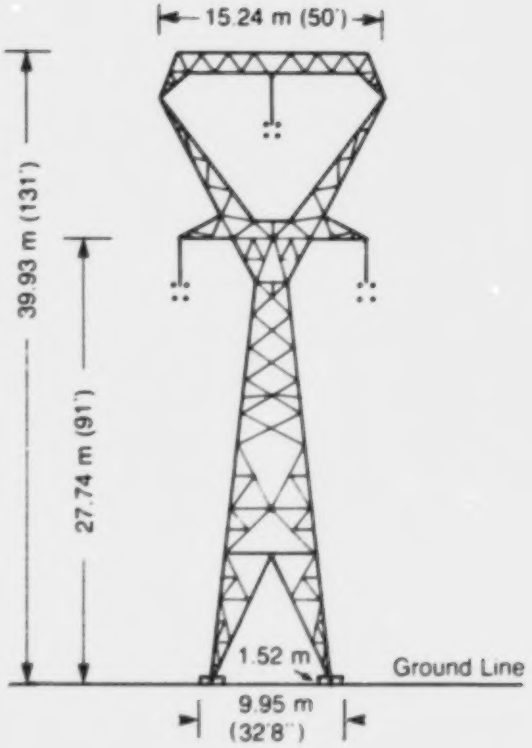

15.24 m (50')
39.93 m (131')
27.74 m (91')
1.52 m
Ground Line
9.95 m
(32'8")

Figure 7.1
500 kV Single Circuit
Conventional Lattice Tower

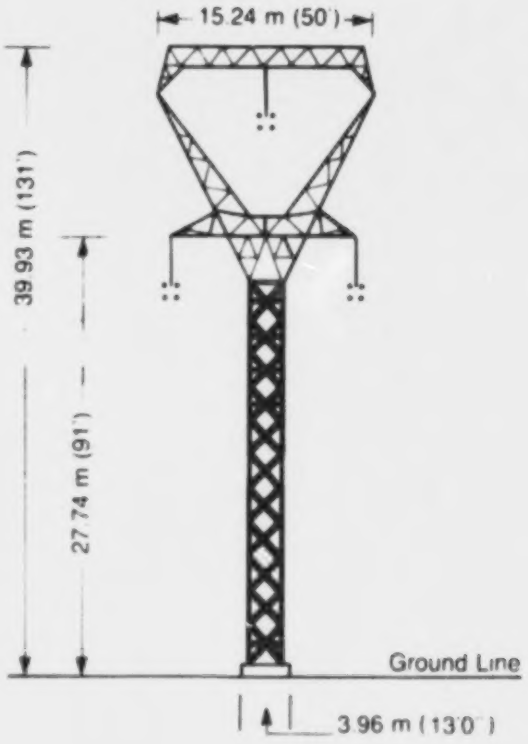

15.24 m (50')
39.93 m (131')
27.74 m (91')
Ground Line
3.96 m (13'0")

Figure 7.2
500 kV Single Circuit
Narrow Base Lattice Tower

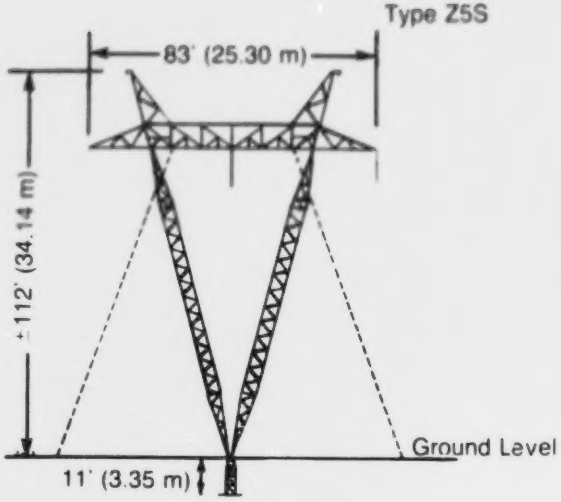

Type Z5S
83' (25.30 m)
± 112' (34.14 m)
Ground Level
11' (3.35 m)

Figure 7.3
500 kV Single Circuit
"V" Guyed Tower

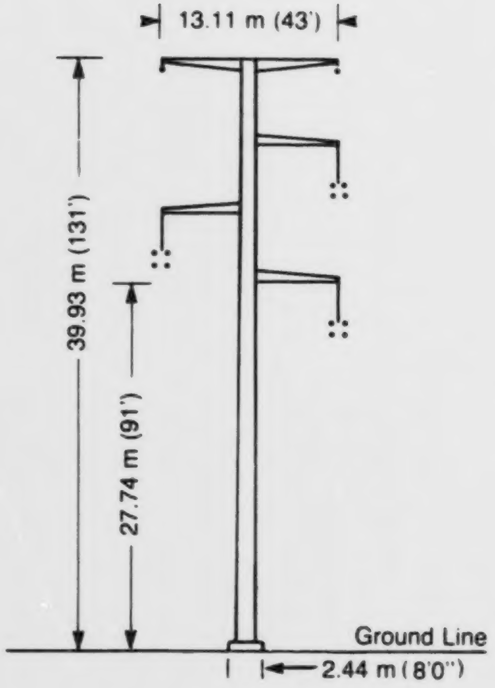

13.11 m (43')
39.93 m (131')
27.74 m (91')
Ground Line
2.44 m (8'0")

Figure 7.4
500 kV Single Circuit
Steel Pole Tower

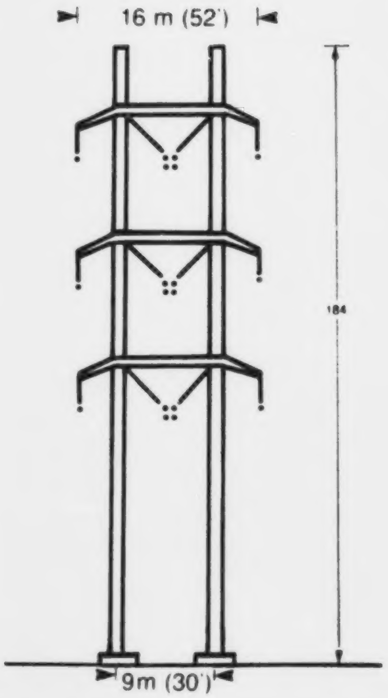

16 m (52')
184
9m (30')

Figure 7.5
500 kV Single Circuit
230 kV Double Circuit Dual Voltage
Steel Pole Tower

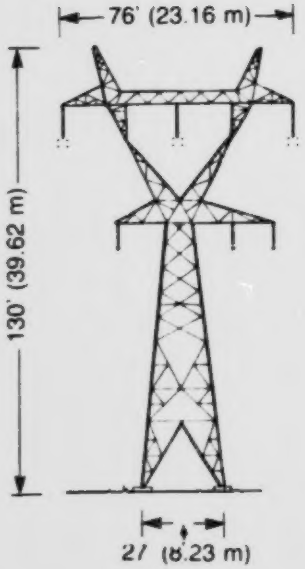

76' (23.16 m)
130' (39.62 m)
27' (8.23 m)

Figure 7.6
500 kV Single Circuit
230 kV Single Circuit Dual Voltage
Lattice Tower

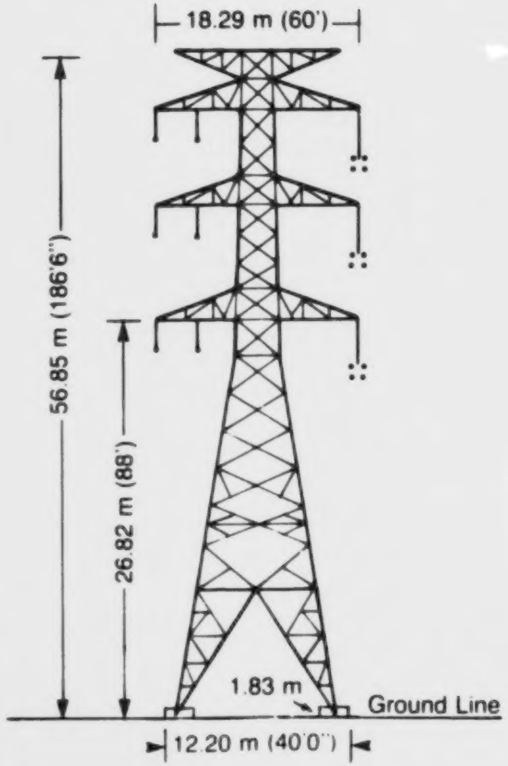

18.29 m (60')
56.85 m (186'6")
26.82 m (88')
1.83 m
Ground Line
12.20 m (40'0")

Figure 7.7
500 kV Single Circuit
230 kV Double Circuit Dual Voltage
Lattice Tower

(e) Dual Voltage Structures

- Sections of the new lines will parallel existing 115 kV or 230 kV rights of way and the use of a dual voltage or combination tower has been considered. It is possible to consolidate the existing lines on the structures shown on Figures 7.5 to 7.7.

7.1.4 Rights of Way

The width of the right of way (ROW) is a function of several design considerations, such as tower height, distance between towers, conductor size, clearances, line security and the condition of the terrain through which the line will pass. The right of way requirement for a single circuit 500 kV line will be between 60-75 m and for two single circuit 500 kV lines will be between 100-130 m. The exact ROW requirements will depend on the tower selected and specific site conditions.

National standards dictate the minimum clearances required from conductors for the protection of adjacent property, and for safe and continuous operation. Table 7.1 shows minimum vertical clearances to 500 kV transmission lines as specified in CSA Standard C22.3, No. 1-M1979, "Overhead Systems and Underground Systems".

Table 7.1

Clearances to 500 kV Transmission Lines

Vertical Clearances	Distance
Land Normally Traversed by Pedestrians Only	6.3 m (21 ft)
Over Roads and Lanes	11.1 m (36 ft)
Over Farm Lands and Lands Accessible to Vehicular Traffic*	9.6 m (31.5 ft)

* Over farm lands, Ontario Hydro goes beyond the CSA Standards and provides a minimum clearance of 12.2 m (40 ft).

7.2 Transformer and Switching Stations

As outlined in the eastern Ontario Plan Stage EA, work is proposed at Hawthorne TS, Merivale TS, St. Lawrence TS and Lennox GS. The work at Merivale TS, St. Lawrence TS and Lennox GS can be accommodated within the existing property limits. At Hawthorne TS, additional property will be required.

7.2.1 Hawthorne TS

Hawthorne TS is a major 230 kV and 115 kV transformer station in the eastern part of Ottawa. A photograph of the station is shown in Figure 7.8 and the proposed layout in Figure 7.9.

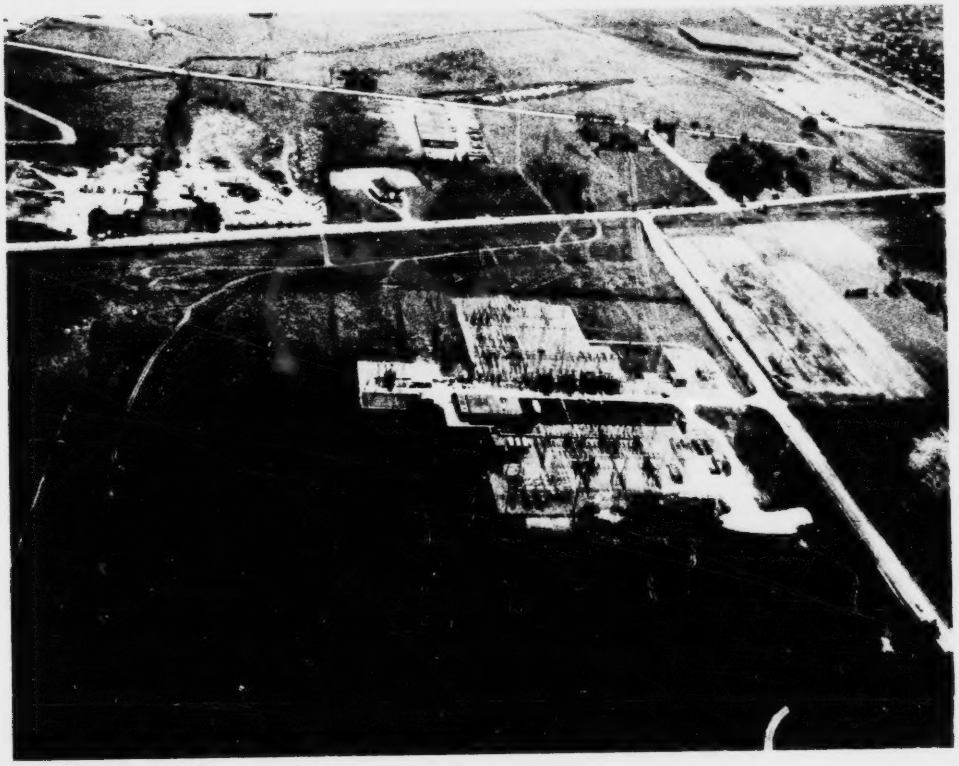


Figure 7.8
Hawthorne TS
Existing Facilities

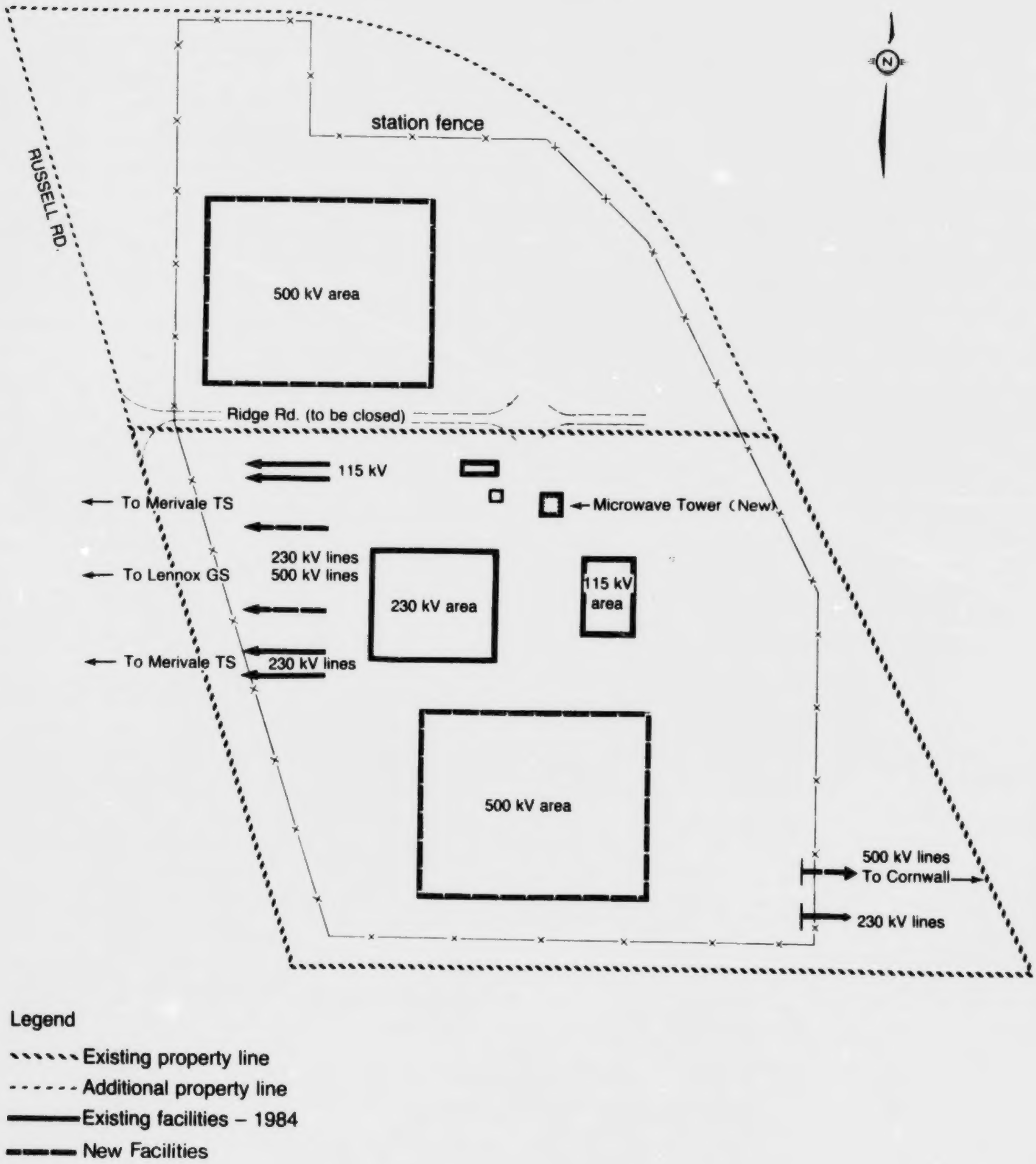

N
station fence
RUSSELL RD.
500 kV area
Ridge Rd. (to be closed)
115 kV
To Merivale TS
Microwave Tower (New)
230 kV lines
500 kV lines
To Lennox GS
230 kV area
115 kV area
To Merivale TS
230 kV lines
500 kV area
500 kV lines
To Cornwall
230 kV lines
Legend
Existing property line
Additional property line
Existing facilities – 1984
New Facilities

Figure 7.9
Hawthorne TS
Proposed Arrangement

Additional 500 kV and 230 kV switching equipment, 500-230 kV transformation and telecommunications facilities are required. The additional property required is shown on Figure 7.9

7.2.2 Merivale TS

Merivale TS is a major 230 kV and 115 kV transformer station west of Ottawa, in the City of Nepean. Additional 230 kV switching equipment is required. The new 230 kV switching facilities will be housed in the existing SF6 switchgear building. The two 500 kV circuits from Lennox GS to Hawthorne TS will be routed through the station with provision for connections to the existing facilities in the future. A photograph of the existing station is shown on Figure 7.10. No additional property is required at this station.

7.2.3 Lennox GS

Additional 500 kV switching facilities are required at Lennox GS. These can be accommodated on the existing site with no additional property acquisition. Figure 7.11 shows a photograph of the existing 500 kV switchyard and Figure 7.12 illustrates the changes that would be required.

7.2.4 St. Lawrence TS

Additional 230 kV switching equipment, a 500-230 kV transformer and telecommunications facilities are required. A photograph of the existing station is shown on Figure 7.13. The proposed layout for St. Lawrence TS is being developed during the course of the East Section Study and the recommendation will be documented in Volume III.

7.3 Microwave Radio Stations

A typical microwave radio station requires a parcel of land approximately 30 metres square, close to an all-weather road with an electrical distribution line.

Dish antennae mounted on a steel tower, 50 to 100 meters in height are used to transmit and receive radio signals.

A masonry or pre-fabricated steel building approximately 6 metres square houses the radio equipment and back-up battery. The entire site is fenced (refer to Figure 7.14).

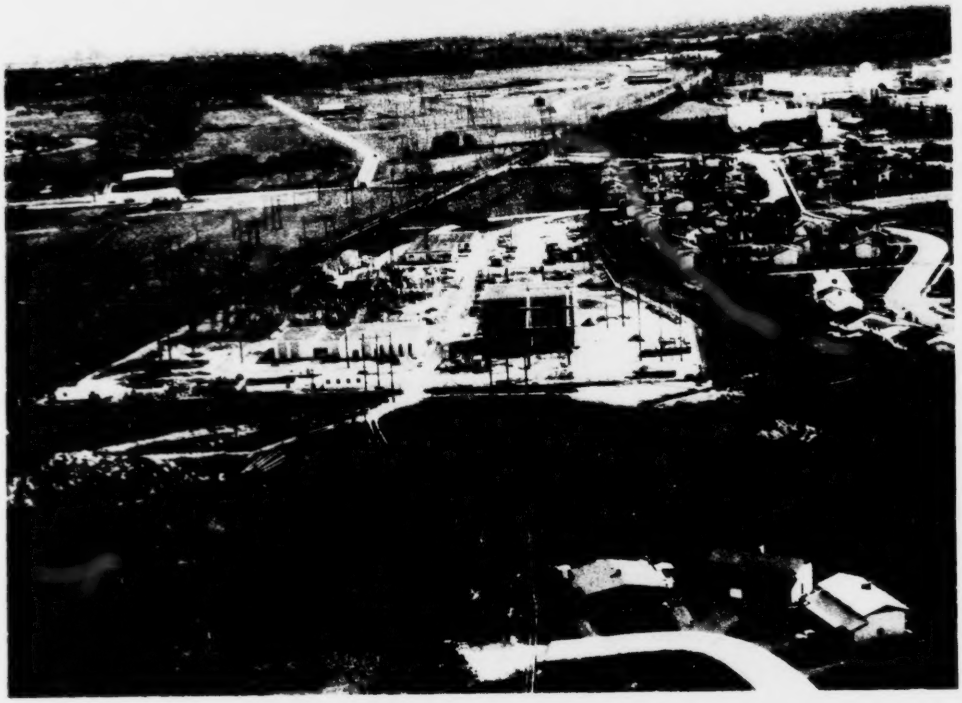


Figure 7.10
Merivale TS
Existing Facilities

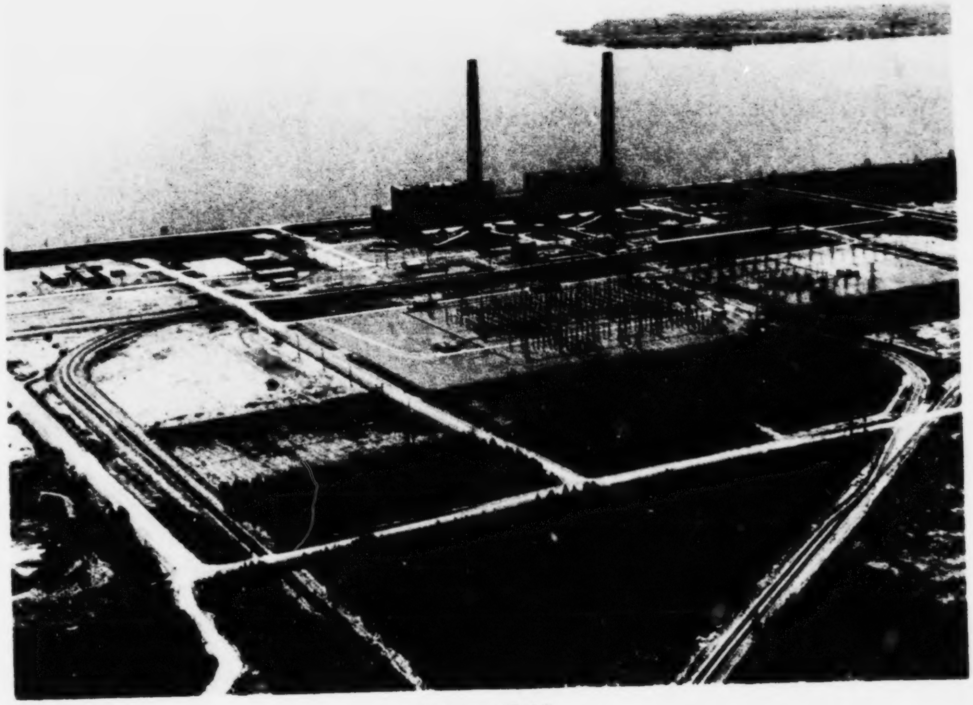


Figure 7.11
Lennox GS – Existing Facilities

Figure 7.12
Lennox GS – Proposed Arrangement

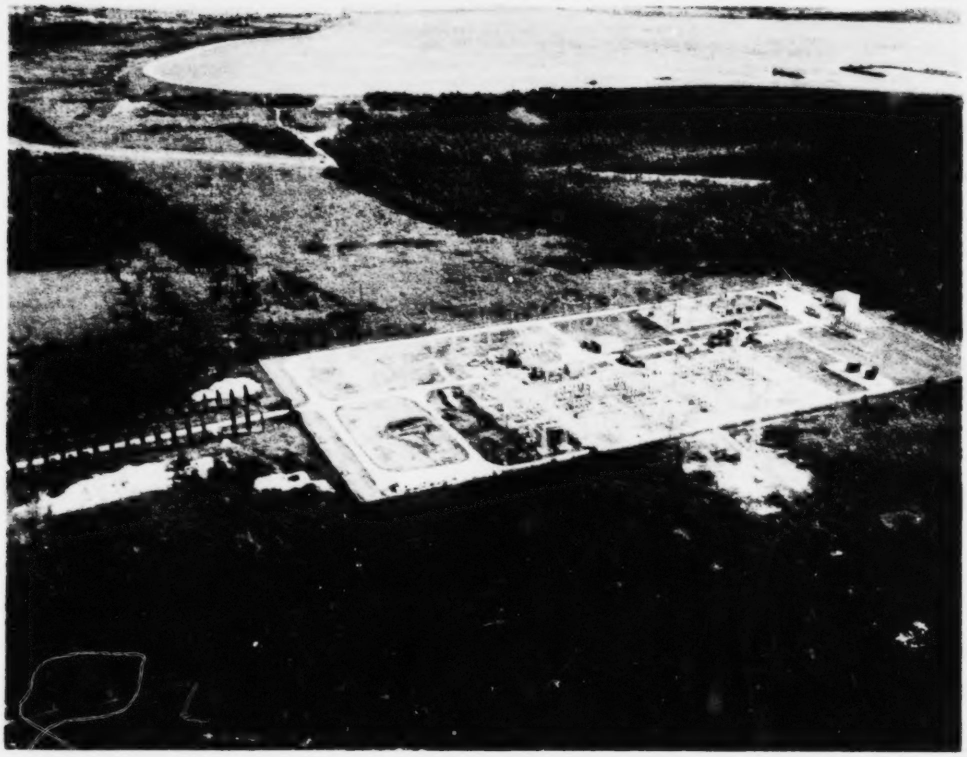


Figure 7.13
St. Lawrence TS
Existing Facilities

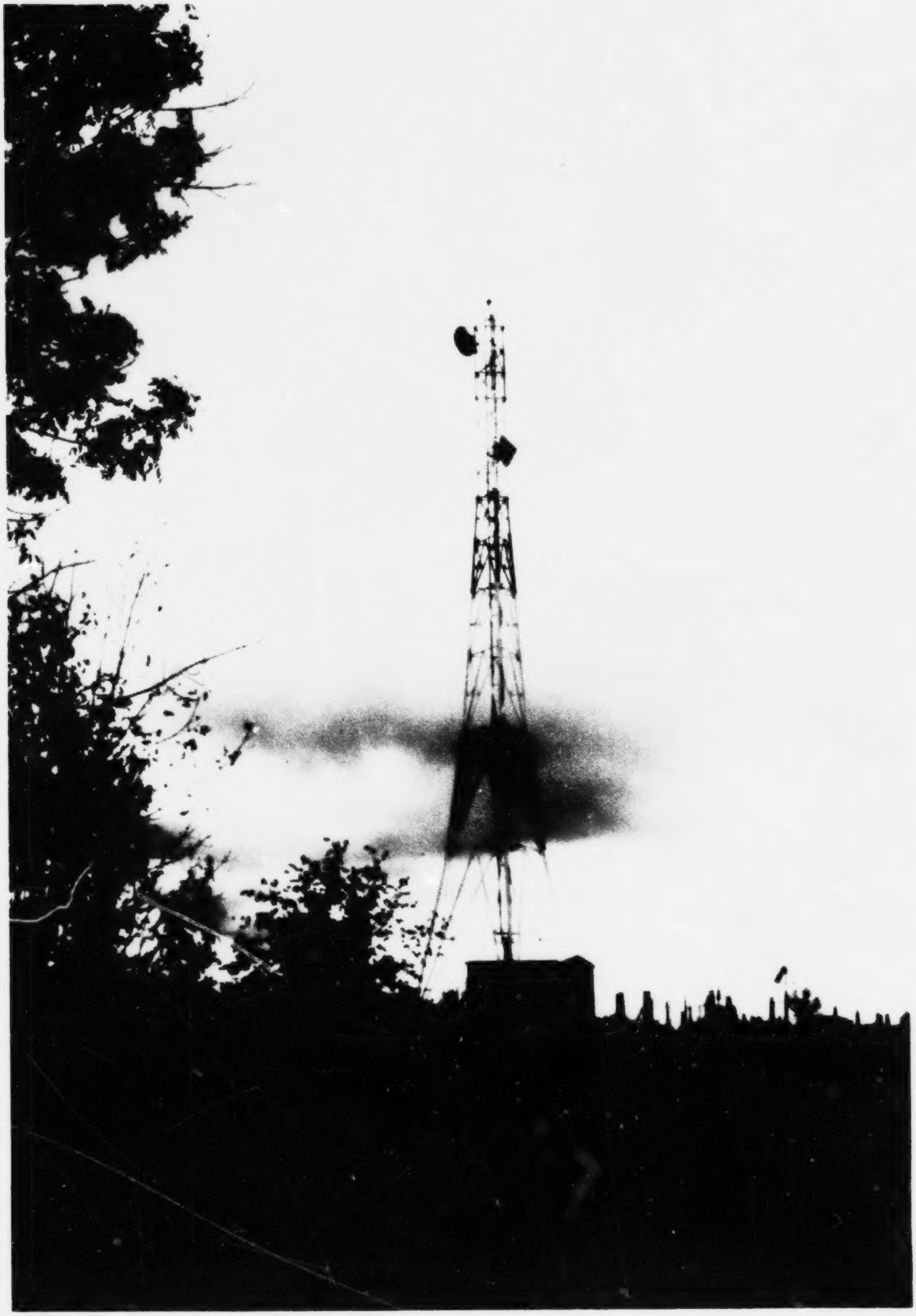


Figure 7.14
Typical Microwave Radio Station

Line
Numbers

APPENDIX A

Joint Board Decision - September 28, 1982

Ontario

The Joint Board

THE CONSOLIDATED HEARINGS ACT, 1981

DECISION

ONTARIO HYDRO -
EASTERN ONTARIO
TRANSMISSION SYSTEM EXPANSION

PLAN STAGE

Before: D. S. COLBOURNE
B. E. SMITH
D. H. McROBB

CH-81-01

JOINT BOARD
THE CONSOLIDATED HEARINGS ACT, 1981
(S.O. 1981, c. 20)

IN THE MATTER OF Sections 2 and 3 of the Consolidated Hearings Act, 1981,

- and -

IN THE MATTER OF Section 12(2) and (3) of the Environmental Assessment Act (R.S.O. 1980, c. 140),

- and -

IN THE MATTER OF Sections 13, 14, 15, 17, 29, 39, 40 and 49 of the Planning Act, (R.S.O. 1980, c. 379),

- and -

IN THE MATTER OF Sections 6, 7, and 8 of the Expropriations Act (R.S.O. 1980, c. 148),

- and -

IN THE MATTER OF an undertaking of Ontario Hydro consisting of the planning of, selection of locations for, acquisition of property rights for, and the design, construction, operation and maintenance of additional bulk electricity system facilities in Eastern Ontario consisting of switching and transformer stations, communications and control facilities, transmission lines and related facilities.

PARTIES

1. Ontario Hydro,
Attn: Bruce Campbell
and Gordon Willcocks,
c/o Tilley, Carson & Findlay,
44 King Street West,
TORONTO, Ontario.
M5H 1G4

2. Minister of the Environment,
c/o David Crocker,
135 St. Clair Avenue West,
14th Floor,
TORONTO, Ontario.
M4V 1P5

3. Regional Municipality of
Ottawa-Carleton,
c/o J. D. Cameron,
222 Queen Street,
OTTAWA, Ontario.
K1P 5Z3

4. Michael Nault et al,
(styled as Hydro Consumers
Association),
c/o Steven Shrybman,
The Canadian Environmental
Law Association
8 York Street,
5th Floor South,
TORONTO, Ontario.
M5J 1R2

5. The Corporation of the
Township of Goulbourn,
c/o Nancy Walker,
P. O. Box 189,
STITTSVILLE, Ontario.
K0A 3G0

6. Energy Probe,
c/o Andrew MacDonald,
53 Queen Street,
OTTAWA, Ontario.
K1P 5P7

7. Department of the Environment
Parks Canada,
c/o Keith Dewar,
Ontario Regional Office,
Attn: Superintendent of the
Rideau Canal,
12 Maple Avenue North,
SMITHS FALLS, Ontario.
K7A 1Z5

8. Murray Maynard et al
(styled as the Greater Bob's
Lake Association),
c/o Tom Chase-Chasgarin,
157 Dunvegan Road,
TORONTO, Ontario.
M5P 2N8

9. Tay Valley Planning Board,
c/o Norman Ferrier,
R. R. #3,
PERTH, Ontario.
K7H 3C5

10. Larry McDermott,
R. R. #3,
LANARK, Ontario
KOG 1KO

11. Daniel Corrigan,
R. R. #3,
LANARK, Ontario.
KOG 1KO

12. Judith Lee,
R. R. #3,
LANARK, Ontario.
KOG 1KO

The Reasons for the Decision herein were delivered on August 6, 1982. Pursuant to those reasons, a draft Decision was prepared by the proponent and concurred to by all parties as being in accordance with these reasons. Accordingly, the Decision of the joint board is as follows:

DECISION

The joint board approves the plan stage of the proponent's electrical transmission system expansion program for Eastern Ontario in accordance with the terms and conditions of approval set out in this Decision.

TERMS AND CONDITIONS OF APPROVAL

1. The basis for the proponent's route stage studies shall be -
   - (i) the bulk electricity transmission system plan designated as system plan M3; and
   - (ii) the route stage study area associated with system plan M3.
2. With respect to the interconnection facilities included in the undertaking, Ontario Hydro is required to assess in greater detail the cost and benefits of those facilities, the facility type to be selected, and the impacts of route alternatives within the approved route stage study area, and to present evidence on its findings at the route stage of the hearings.

3. No approval is given to the general outline of future activities as set out in clause 3 of Ontario Hydro's description of the Program. This term and condition shall not be taken as preventing Ontario Hydro from carrying out such studies and activities as are required, in Ontario Hydro's opinion, to support any application for such further approvals as may be required in connection with this undertaking.

The approximate route stage study area is as shown on the map attached as Appendix "A" to this Decision.

This decision is without constraint to the decision or decisions to be made by this joint board in respect of any matter or matters deferred by Order of this Board made November 25, 1981, and confirmed by a further Order dated January 21, 1982.

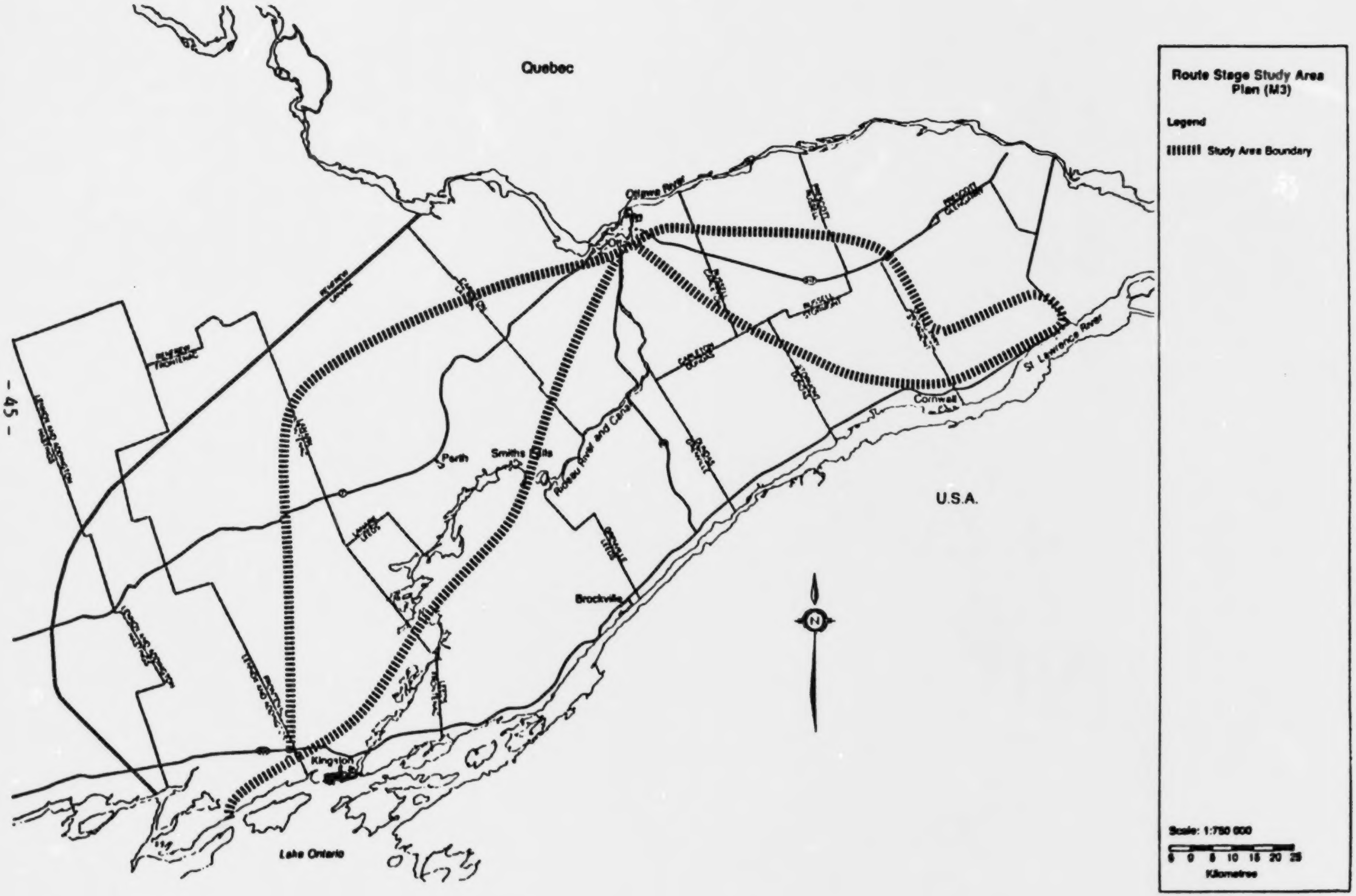
THE FOREGOING IS THE DECISION OF THE JOINT BOARD, delivered on the 6th day of August, 1982.

D. S. COLBOURNE,
Chairman

B. E. SMITH,
Vice-Chairman

D. H. McROBB,
Member

APPENDIX "A" TO DECISION OF THE JOINT BOARD


Quebec
Ottawa River
Perth
Smiths Falls
Rideau River and Canal
Brockville
Cornwall
St Lawrence River
U.S.A.
Kingston
Lake Ontario
N
Route Stage Study Area Plan (M3)
Legend
Study Area Boundary
Scale: 1:750 000
5 0 5 10 15 20 25
Kilometres

Line
Numbers

APPENDIX B

Joint Board Decision - June 29, 1984

Line
Numbers

IN THE MATTER OF Sections 2 and 3 of The Consolidated Hearings Act, 1981

- and -

IN THE MATTER OF Section 12(2) and (3) of The Environmental Assessment Act, (R.S.O. 1980, c. 140)

IN THE MATTER OF Sections 13, 14, 15, 17, 29, 39, 40 and 49 of The Planning Act (R.S.O. 1980, c.379)

IN THE MATTER OF Sections 6, 7 and 8 of the Expropriations Act (R.S.O. 1980, c.148)

- and -

IN THE MATTER OF an undertaking of Ontario Hydro consisting of the planning of, selection of locations for, acquisition of property rights for, and the design, construction, operation and maintenance of additional bulk electricity system facilities in Eastern Ontario consisting of switching and transformer stations, communications and control facilities, transmission lines and related facilities

BEFORE:

D.S. Colbourne Chairman	)	
B.E. Smith Vice-Chairman	)	May 28, 29 & 30, 1984 and June 4 & 5, 1984
D.H. McRobb Member	)	

ORDER

UPON A MOTION with respect to the undertaking referred to in Style of Cause having been brought by Ontario Hydro for an order of the Joint Board:

(a) amending the Notice to the Hearings Registrar dated the 7th day of August, 1981, by removing from the first sentence of the second paragraph of the Notice the words:

> "and to enable Ontario Hydro to deliver from and receive an interconnection with Hydro-Quebec about 2,000 MW of electric power for the mutual benefit of Ontario and Quebec".

(b) amending the Decision of the joint board dated the 6th day of August, 1982, and the Order of the joint board dated the 24th day of January, 1984, to permit a route stage decision to be made with respect to the facilities proposed for the area between Lennox G.S. and Hawthorne T.S. prior to a decision being made with respect to the location of the facilities proposed for the area between Hawthorne T.S. and St. Lawrence T.S.;

(c) giving directions to Ontario Hydro with respect to serving Notice of the Route Stage Hearing;

(d) giving directions with respect to the filing of documents; and

(e) deleting all reference to the Planning Act, as a result of the coming into force of the Planning Act, 1983.

AND UPON THIS MOTION having come on for hearing at the Nepean Sportsplex on May 28, 29 and 30, and on June 4 and 5, 1984;

AND UPON THIS BOARD having heard submissions from other counsel, other parties and interested persons;

WHEREAS THE BOARD having heard uncontradicted evidence with respect to:

: further expected delays in the joint studies wth Hydro Quebec;

: the lack of upgrading potential in the transmission system;

: the continuing growth of the critical load of the Ottawa area; and that

: subsequent to environmental and cost reviews, that M3 remains the preferred plan;

AND WHEREAS THE BOARD having concluded that:

: the granting of this application will have no prejudice to either the Board's decision dated the 6th day of August, 1982, or to the continuation of the route stage hearings with respect to the western section; and

: the granting of the deferral, in the Board's Order dated January 24, 1984, of the route stage hearings for the Eastern (Hawthorne T.S. to the St. Lawrence T.S.) section, would not prejudice the route stage hearings for the Western (Lennox G.S.to Hawthorne T.S) section;

NOW, THEREFORE, THE BOARD ORDERS:

1(a) the deletion from the first sentence of the second paragraph of the Notice to the Hearings Registrar dated the 7th day of August, 1982, the words:

> "and to enable Ontario Hydro to deliver and receive from an interconnection with Hydro-Quebec, about 2,000 MW of electric power for the mutual benefit of Ontario and Quebec";

and

1(b) the subsequent deletion of the condition in the Board's Order of January 24, 1984, relating to the said interconnection;

2. the deferral of any preliminary or other hearing, other than the general issues relating to all facilities, and the specific locational issues for the facilities proposed between Lennox G.S. and Hawthorne T.S., until at least 30 days after the filing with the Minister of the Environment of an environmental assessment for the specific locational issues for the facilities proposed between Hawthorne T.S. to St. Lawrence T.S.; and,

The Board will proceed to the route stage hearings on the basis of an environmental assessment of the general issues related to all facilities, and to the facilities proposed between Lennox G.S. and Hawthorne T.S., without having met Term and Condition 2 of the Board's decision of August 6, 1982, and the condition in the Order of the joint board dated the 24th day of January 1984.

3. Notice of the Route Stage hearing shall be given by two mailings and one newspaper publication, as follows:

(a) the first mailing of the Notice, which shall include notice of the Route Stage Preliminary Hearing (scheduled to be held at 10:00 a.m. on Tuesday, November 20, 1984, at the Nepean Sportsplex, Nepean, Ontario) shall be given during the month of August, 1984 in accordance with Form 1, attached hereto, and forming part of this Order;

(b) the second mailing of the Notice, which shall include notice of the Route Stage Preliminary Hearing (scheduled to be held at 10:00 a.m. on Tuesday, November 20, 1984, at the Nepean Sportsplex, Nepean, Ontario) shall be given during the month of October, 1984 in accordance with Form 2, attached hereto, and forming part of this Order;

At least thirty days shall be allowed between the date of the second mailing of the Notice and the date of commencement of the Route Stage Preliminary Hearing. However, the Preliminary Hearing shall not commence sooner than ten days after publication of the Review of the Environmental Assessment;

(c) newspaper publication, in accordance wth Form 3, attached hereto, and forming part of this Order, shall be given at least twenty-one days prior to the date of commencement of the Route Stage Preliminary Hearing.

4. Ontario Hydro shall explain the procedure for the two mailings of its notice in a covering letter, or in a suitable publication, and such covering letter shall be in the form set out in Form 4, attached hereto, and forming part of this Order.

5. The said Notice shall be given by mailing by prepaid first class mail to those persons set out in Forms 5(A), 5(B) and 5(C) attached hereto, and forming part of this this Order, and every diligent effort shall be made by Ontario Hydro to redirect mail and to effect service.

6. The said newspaper notice referred to in Clause 3(c) herein shall be published in the newspapers listed in Form 6, attached hereto, and forming part of this Order.

7. The Environmental Assessment, the Review under the Environmental Assessment Act prepared by Ministries and Agencies of the Province of Ontario and other relevant documents under the control of Ontario Hydro and intended to be submitted in support of this undertaking, shall be made available for public inspection as soon as is practicable at the locations as set out in Form 7, attached hereto, and forming part of this Order.

8. Repositories for Transcripts, Exhibits and other Hearing Record documents shall be made available at the four locations set out in Form 8, attached hereto, and forming part of this Order.

9. Since the Planning Act, 1983, has been given Royal Assent, and Section 61 of that Act states that Ontario Hydro is not affected by the Act, except in certain situations, and since land use planning evidence may be relevant to the acceptance of the environmenal assessment and to the approval to proceed with the undertaking under the Environmental Assessment Act, the Style of Cause shall be amended by deleting all references to the Planning Act.

10. **UPON COUNSEL FOR** the Hydro Consumers' Association and the No Towers Federation having requested costs relating to the hearing of this motion, since the funding situation of these two agencies had not altered since the plan stage hearing or, indeed, the motion held on the 13th day of December, 1983;

AND UPON THIS BOARD having been requested by other counsel to consider the joint board's Order dated December 16, 1981, relating to the Southwestern Ontario Plan Stage hearing, and specifically to the joint board's criteria for the award of costs enunciated in its Reasons for Order of the same date;

AND UPON THE JOINT BOARD HAVING GIVEN CONSIDERATION to those criteria and the simple fact of the hearing of two separate motions relating to the interconnections;

NOW, THEREFORE, THE JOINT BOARD ORDERS that Ontario Hydro shall pay the costs of counsel for the Hydro Consumers' Association and the No Towers Federation relating to the hearing of this motion, in an amount to be determined by the Board, and based on an invoice to be submitted for the said costs;

11. **AND THE JOINT BOARD FURTHER ORDERS** that Ontario Hydro shall

(a) be responsible for arranging hearing accommodation for the Preliminary and any subsequent hearings relating to this matter; and

(b) pay the costs of reporting of this motion.

D.S. Colbourne
Chairman

B.E. Smith
Vice-Chairman

D.H. McRobb
Member

DATED at TORONTO this 29TH day of JUNE, 1984

APPENDIX C

Telecommunications

Line
Numbers

APPENDIX C

TELECOMMUNICATIONS

(a) Microwave Radio Communication

Radio telecommunications in the microwave frequency band is generally used for multi-channel, point-to-point communication. The distance between two adjacent microwave radio stations, depending on the operating frequency, tower height and the intervening topography, may range from a few km to over 50 km. In order to reduce propagation loss between two stations, radio line-of-sight path between the stations is required. In cases where the topography between two stations is too rugged and the radio line-of-sight path is obstructed, or the distance between the two stations is too large, a repeater station is installed to relay communications between the two locations.

Ontario Hydro presently has an operational microwave radio communications network in southern and part of northern Ontario, primarily for protection and control of the BES. The system operates in the 7 GHz band (7125-7725 MHz) which has been recently allocated by the Department of Communications (DOC) to all power utilities in Canada to be used on a primary but non-exclusive basis for protection and control of electricity systems. The advantages of microwave are:

(1) High Reliability - A microwave radio system can be engineered to provide extremely reliable communications by such techniques as route diversity, space/frequency diversity, use of hot standby equipment, etc.

(2) High Capacity - A maximum radio frequency (RF) bandwidth of 19.5 MHz per microwave link is allocated in the 7 GHz band. Once the system is in place, up to 960 VF channels can be accommodated easily and at relatively low cost if the proper IF bandwidth in the radio equipment has been selected at the outset.

(3) Relatively Interference-free - The 7 GHz band is relatively free of interference from power line-related and other man-made noise sources. Although the band is shared with common carriers and the Federal Government for satellite communications, electrical utilities in Canada have been granted primary user status in this band by the DOC, thereby restricting other non-electrical utility users from placing new terrestrial services in this band.

(4) Independence from Power Lines - Faults on power lines and system disturbances have no effect on microwave radio system.

(5) Independence from Weather Conditions - Microwave radio systems operating in the 7 GHz band are not affected by rain or snow. Microwave radio links in excess of 50 km and traversing areas where propagation abnormalities are present can experience signal fading due to such factors as multipath reflections, refraction, ducting, antenna decoupling, etc. However, this problem can be remedied by using such techniques as frequency/space diversity or employment of additional repeater stations.

(6) Costs - Capital costs are generally lower than those of cable communications systems except for short distances. A larger number of circuits can be provided than is technically and economically possible using PLC systems.

(b) Power Line Carrier (PLC)

PLC systems utilize the physical paths formed by power lines interconnecting generating stations and load centers for transmission of information needed to manage and control complex electrical power networks. Generally, a PLC system consists of three distinct sub-systems:

(1) The high voltage line that must provide a satisfactory bearer medium for the high frequency signals between the terminal stations.

(2) The coupling equipment which serves as a means of connecting the carrier equipment to the high voltage line.

(3) The carrier equipment which is comprised of transmitters, receivers, power supplies and associated components.

Power line carrier equipment has been utilized in Ontario Hydro for many years and is still being used in remote areas of the province. A prime example is in northern Ontario. This bearer medium is primarily used for protection, control and voice communications in a power system.

In protection applications, the signals transmitted over the power lines must be capable of operating correctly during power system fault conditions which may affect signal transmission. Similarly, the noise generated by a line fault or switching operations must not cause false operation. These difficulties can be minimized by proper system design and a more complex relaying scheme and by using appropriate coupling techniques.

A properly designed and implemented PLC system can offer reasonably secure telecommunications over a long distance at a relatively low cost, but channel capacity is limited due to frequency congestion.

There are some disadvantages associated with PLC communications and they are summarized as follows:

(i) Limited channel capacity: This is due to the limited frequency band available and system congestion. In the case of the proposed eastern Ontario BES, there is channel capacity available for BES protection functions only.

(ii) Affected by environmental conditions: PLC system performance may be degraded by weather conditions such as snow, sleet, icing, and rain.

(iii) Affected by power system disturbances: PLC system performance will be degraded by line faults and equipment noise.

(iv) Potential interference from and to other licensed users operating in the same frequency band. A PLC system operating in the same frequency band and in close proximity to a licenced high-power radio station may be susceptible to interference from the licenced station. PLC systems are not protected by the Federal Department of Communications (DOC) which ceased licensing such systems some time ago. If a PLC system interferes with a licensed radio user, the PLC system has to cease operation immediately upon notification by the DOC. If no alternative frequency can be found, and the interference cannot be eliminated, then the PLC system must be taken out of service.

For 500 kV transmission to loads of the size and importance of the Ottawa area load, a PLC system is not technically acceptable. However, it may be used as a secondary system to a microwave system, and may thereby reduce the number of microwave station facilities required.

(c) Fiber Optics

The basic operating principle of fiber optic telecommunications is that the information usually in digital form is converted to an optical signal which propagates from the transmitting end to the receiving end by bouncing between the inside walls of the glass fiber. At the receiving end, a photodetector is used to convert the modulated light signal back to its original electrical equivalent.

To communicate over a longer distance, repeater stations, which regenerate the signal and are typically spaced 30-35 km apart, are required in order to maintain reliable communications.

In the past few years, many power utilities have installed fiber optic trial systems of 5-15 km length to evaluate the suitability of the medium for power system telecommunications, teleprotection and telecontrol functions. Over these short distances, the systems have provided satisfactory operation for power utilities. However, up to this date, no known long distance fiber optic systems have been installed by power utilities in Canada for teleprotection functions.

Ontario Hydro has recently completed a fiber optic trial installation in the Toronto area between Fairchild TS and Leslie TS. The total distance is 5.2 km, and the system is being evaluated for its suitability in power system applications.

(d) Leased Facilities

The advantages and disadvantages of leased microwave circuits for operational telecommunications have been undergoing review for many years. It is not economical for common carriers to build a dedicated communications system solely to satisfy Ontario Hydro's requirements.

Therefore, in the past, Ontario Hydro has been building its own communications system to satisfy the needs of the BES. Presently, Ontario Hydro has an extensive microwave radio network covering most of southern Ontario and part of northern Ontario.

For dependability and security reasons, the telecommunications facilities used for protection of the proposed 500 kV bulk electricity system in eastern Ontario must be Ontario Hydro owned. However, in eastern Ontario, leased facilities will be used for non-protection communications functions.

(e) Sharing of Existing Non-Hydro Communications Sites and Tower Space

Ontario Hydro has investigated the alternative of joint-use of existing microwave radio towers and sites with common carriers who owned such facilities in eastern Ontario.

Both CNCP Telecommunications and Bell Canada were requested to state their corporate policies regarding sharing of microwave radio tower space and leasing/selling of excess property in the immediate vicinity of their microwave radio tower sites, for the purpose of erecting additional microwave radio towers for Ontario Hydro. Bell Canada has advised that they will not lease site space for Ontario Hydro's microwave facilities.

CNCP Telecommunications agreed to share its sites subject to tariff requirements and acceptance of a number of licensing conditions. However, some of the conditions stipulated were so restrictive, both technically and operationally, that they effectively ruled out any possibility of Ontario Hydro using the CNCP facilities to extend the microwave radio network.

(f) Communications via Satellite

A review of satellite communications is useful in understanding how a satellite link affects communication. A typical commercial communications satellite hovers above the earth's equator at an altitude approximately 36,000 km. At this altitude, a satellite orbits the earth at exactly the time period as the earth's rotation on its axis, just under 24 hours. Such a satellite is called a "Geosynchronous" satellite because its orbit is synchronous to the earth's rotation, and the orbit is sometimes referred to as geosynchronous orbit. A satellite placed in a geosynchronous orbit appears to be stationary in the sky when viewed from earth.

In satellite telecommunications, the propagation time delay for a returned signal traveling at the speed of light (3 x 10^5 km/s) is approximately 250 ms. This elapsed time far exceeds the maximum allowable response time of 17 ms for high speed tripping, therefore, satellite telecommunications is not acceptable for protection of BES.

APPENDIX D

Microwave Telecommunications System Alternatives

Line
Numbers

APPENDIX D

MICROWAVE TELECOMMUNICATIONS SYSTEM ALTERNATIVES

In order to satisfy the microwave telecommunications requirements for eastern Ontario, two possible system alternatives, each having advantages and disadvantages, are outlined herein:

(a) Option 1 - Frequency Diversity Microwave Radial System With PLC as a Parallel System

This option consists of a frequency diversity microwave radial system extending from Hinchinbrooke SS to Hawthorne TS to St. Lawrence TS, and a PLC system from Lennox GS to Hawthorne TS to St. Lawrence TS. A similar configuration is used for protection of the existing 500 kV line between Essa TS, near Barrie and Hanmer TS, near Sudbury.

A new telecommunications system will have to be built to serve the eastern Ontario bulk electricity system. In Option 1, protection functions will be carried on microwave radio and PLC. Since there is sufficient capacity in PLC to carry protection functions only, other traffic will have to be carried on microwave radio. System security requires that the Data Acquisition Computer System (DACS) circuits must be route-diversified to avoid common mode failures. Therefore, DACS will be carried on microwave radio and leased facilities.

The advantages of this option are the relatively lower initial capital cost and the reduction in the number of microwave tower sites required. The disadvantages would include continuation of leased facilities, although at a much reduced level, and some of the potential technical problems associated with PLC described previously.

(b) Option 2 - Microwave Full Ring System

This option consists of a microwave radial system as described in (a) plus a complement of a minimum of five additional repeater stations between Cataraqui TS and Hawthorne TS via St. Lawrence TS, forming the second half of the ring configuration. This system will satisfy all operational requirements including protection and DACS, and will accommodate any system growth in the foreseeable future.

The value of a microwave ring system lies in its ability to retain its system integrity in the event of equipment failure in a station or temporary loss of a link due to RF fading. This can be accomplished since telecommunications between two stations sharing the same ring are carried out via two separate paths, in opposite directions around the ring: the shorter path is called the Main Route, and the longer path the Alternate Route. In the event that the Main Route fails, telecommunications between the two stations can still be maintained via the Alternate Route. Thus, the system reliability is significantly enhanced in the ring configuration. In a microwave radial system, the remote possibility of loss of a station could take the entire system out of service.

This Option requires a larger initial capital outlay due to the additional repeater stations.

Selection of Preferred Telecommunications Option

Microwave radio telecommunications is the required primary bearer medium for the 500 kV bulk electricity system expansion into eastern Ontario.

Of the two microwave telecommunications system configurations outlined above, Option 1, which consists of a frequency-diversity microwave radial system extending from Hinchinbrooke SS to Hawthorne TS to St. Lawrence TS, and a PLC system from Lennox GS to Hawthorne TS to St. Lawrence TS, represents the preferred choice. Technically, it provides the required telecommunication services to eastern Ontario. Economically, it is the most cost-effective alternative. Environmentally, being a radial system it is preferred to a ring system which would require additional station sites. Option 2 was not considered further.

Volume

2

Line
Numbers

Eastern Ontario Transmission Line Study

Route Stage - Volume II

Lennox Generating Station

to Hawthorne Transformer Station

Environmental Assessment

August, 1984

Report No. 84096

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SUMMARY

Volume II describes the land use and environmental, socio-economic, cost and technical studies and the public involvement programme carried out by Ontario Hydro to select the recommended route for the two 500 kilovolt (kV), single circuit (1 cct) transmission lines from Lennox Generating Station (Lennox GS) near Kingston and Hawthorne Transformer Station (Hawthorne TS) in Ottawa and sites for associated telecommunications facilities.

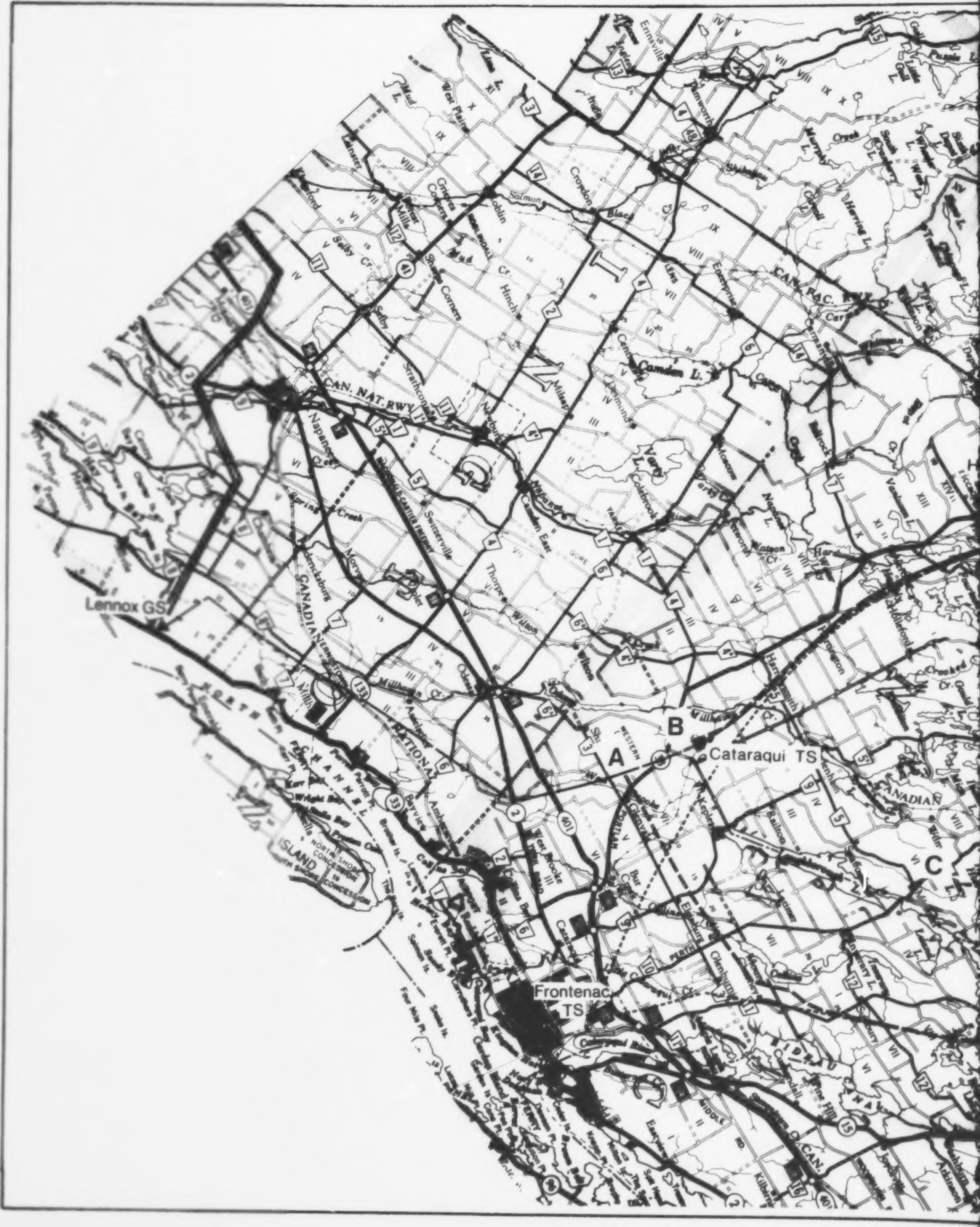
From Lennox GS, the recommended route (refer to Figure 1.1) uses the existing multi-line right of way across South Fredericksburgh, Ernestown and Kingston townships for a distance of 33 km. South of Cataraqui TS the route turns eastward in and generally parallels the north shore of Loughborough Lake through Loughborough and Storrington townships, until it intersects with an existing 115 kV right of way. The route follows this right of way from South Crosby Township to Goulbourn Township. South of Smiths Falls, the route diverts slightly to the east for about 3 kilometres. In Goulbourn Township, the route diverts northward from the 115 kV line and turns eastward south of Stittsville to intersect with an existing 230 kV right of way. From this point, the route follows the existing right of way through to Hawthorne TS. The total distance between Lennox GS and Hawthorne TS is approximately 185 km.

It is proposed that the narrow base lattice tower design would be used for suspension structures located in open cultivated fields of prime farm land and specialty crops, in accordance with criteria established by Ontario Hydro and the Ontario Federation of Agriculture. V-guyed towers would be used in areas of rugged terrain. Special multi-voltage towers will be designed for areas where existing lines would be consolidated with the new circuits. All remaining suspension structures and all angle structures would be conventional four footing lattice towers.

The major reasons for selection of the recommended route were:

- relatively low effects on most environmental factors;
- follows existing rights of way as much as possible, while minimizing effect on human settlement;
- lower socio-economic effects;
- utilizes right of way between Smiths Falls and Richmond on which existing 115 kV line can be removed;
- adheres for the most part to public guidelines;
- least costly alternative;
- low potential for additional property and narrow base tower costs;
- shortest route length.

As described in Volume I the recommended telecommunications system involves extending the existing microwave network from Hinchinbrooke SS to Hawthorne TS. Four new microwave radio stations are required with this plan (refer to Figure 1.1). Two of the stations would be located at existing Ontario Hydro transformer station sites (Hawthorne TS and Smiths Falls TS). These locations were chosen because of technical advantages or requirements and low potential for environmental effects. It is also proposed to locate two .4 ha microwave repeater sites on privately owned property (site M3 in Lot 6, Concession 1, Goulbourn Township and site W2, Lot 17, Concession 7, North Crosby Township). These sites were recommended because of relatively low potential for environmental effects and lower construction costs.


Lennox GS
A
B
C
Cataraqui TS
Frontenac TS
Napanee
CAN. NAT. RWY.
CAN. PAC. RWY.
Camden L.
CANADIAN
NATIONAL
NORTH CHANNEL
ISLAND
NORTH SHORE CONCESSION
SOUTH SHORE CONCESSION
401
2
33
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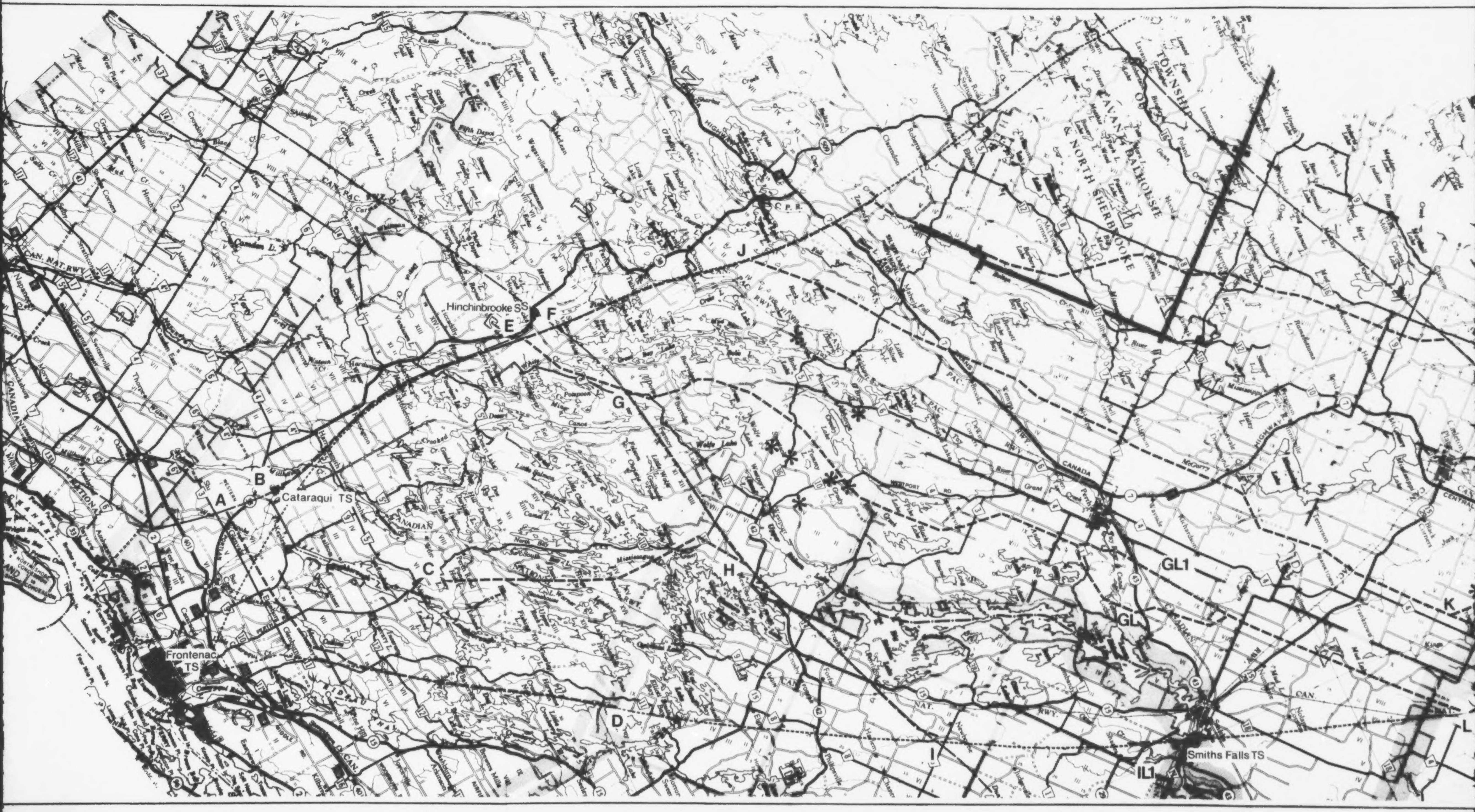
A
B
Cataraqui TS
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E
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Hinchinbrooke SS
G
H
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J
K
L
GL1
GL
IL1
Frontenac TS
Smiths Falls TS
CAN. NAT. RWY
CAN. PAC. RWY
C.P.R.
TOWNSHIP OF
BATHURST
& NORTH SHERBROOKE
HIGHWAY
WESTPORT RD
CANADA
NAT.
RWY.
CAN.
Camden L.
Wolfe Lake
Mississagua
North Bay
Crooked
Canoe
Buck
Fifth Depot
Mississippi
McGarry

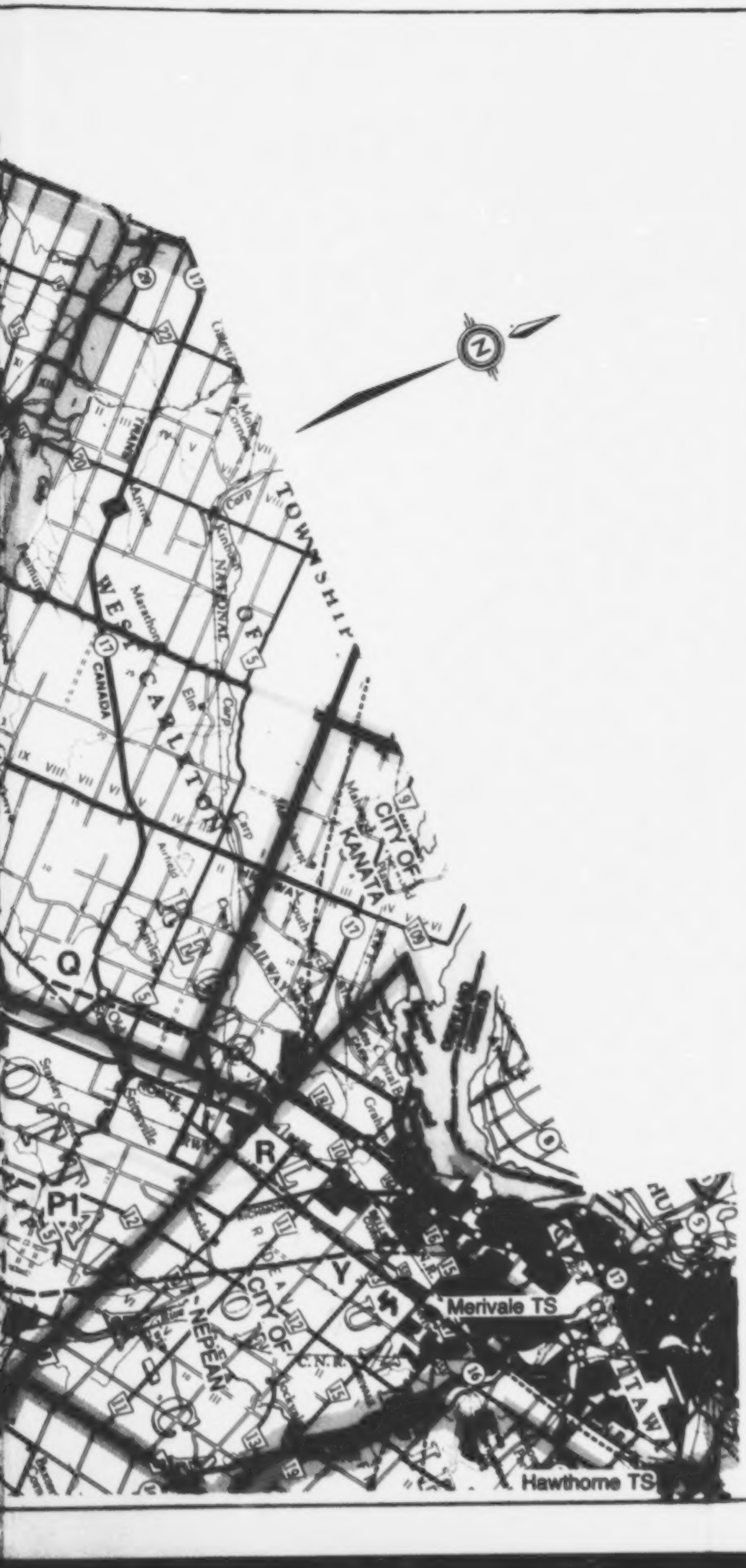

Q
R
P1
Y
Merivale TS
Hawthorne TS
TOWNSHIP OF WEST CARLETON
NATIONAL
CITY OF KANATA
CITY OF NEPEAN
OTTAWA
CANADA
TRANS
RAILWAY
C.N.R.
17
5
16
15
12
N

Figure 1.1

Recommended Route and Sites

Legend

━━ Existing 500 kV Line

— — Existing 230 kV Line

----------- Existing 115 kV Line

■ Transformer or Switching Station

A Route Intersection

Recommended Telecommunication Sites

✱ Alternative Telecommunication Sites

Recommended Route

– – – – Alternative Routes

Alternative routes and sites
are not drawn to scale

Scale 1 250,000

5 0 5 Miles

5 0 5 Kilometres

Eastern Ontario Study – West Section

1.0 INTRODUCTION

The Environmental Assessment (EA) Report for the Route Stage has been prepared in three volumes.

Volume I - covers those aspects of the study which are common to both the proposed transmission lines and telecommunications facilities between Lennox GS and Hawthorne TS, and the transmission line and telecommunications facilities between Hawthorne TS and St. Lawrence TS. These include a description of the undertaking, an update of the need for the proposed facilities and a discussion of the alternatives.

Volume II - describes the study to select the recommended route for two 1 cct 500 kV lines from Lennox GS to Hawthorne TS and sites for associated telecommunications facilities (West Section).

Volume III - describes the study to select the recommended route for a 1 cct 500 kV line from Hawthorne TS to St. Lawrence TS and sites for associated telecommunications facilities (East Section).

Volume II of the EA describes the study which resulted in the selection of the recommended route and sites for the West Section. The route study was initiated in the fall of 1982 and included a public involvement programme.

The Route Study was carried out in four steps: the introduction of the study and data collection; location of alternative corridors and study areas for telecommunications facilities; location of alternative routes and sites; and the selection of the recommended route and sites. In making the selection of the recommended route and sites, the environment as well as technical and cost factors were considered and presented for public review and comment.

The selection of the recommended transmission line route and the selection of the recommended sites for telecommunications facilities is separately documented in this volume with the transmission line studies beginning at Section 2.0 and the telecommunications studies beginning at Section 9.0.

2.0 STUDY PROCESS - TRANSMISSION

2.1 Overview

The West Section Route Stage study was undertaken by Ontario Hydro to select a recommended route for two 1 cct 500 kV transmission lines. The study process followed four steps to reduce the study area approved at the plan stage hearings to a recommended route (refer to Figure 2.1).

The study process integrated the consideration of those aspects of the natural and social environment which could be affected by transmission facilities, with the technical and cost considerations. At each step in the process, more detailed information was used to eliminate part of the study area from further consideration. Reviews and comments were solicited from all levels of government, interest groups and the public as the study progressed.

(1) Introduction of the Study and Collection of Data

- At the outset of the study, Ontario Hydro prepared an inventory of land use and environmental resources in the study area. This information was used to identify thirty-nine environmental situations under nine factor categories, and to define corresponding objective statements outlining the reasons to avoid these situations. The environmental situations and objective statements were used to develop environmental constraint levels, and to prepare factor maps and constraint, diversity and suitability maps for the location of alternative corridors.
- Socio-economic data were collected.
- Members of the community were contacted concurrent with the data collection. In addition, an advisory group was established to represent the regional interests.

(2) Location of Alternative Corridors

- Guidelines were developed for locating alternative corridors.
- Alternative corridors were identified by Ontario Hydro and reviewed by the public and government representatives.

(3) Location of Alternative Routes

- More detailed data were collected within and near corridors, and mapped at a scale of 1:15,000. Alternative routes were identified that best avoided constraint areas, met technical criteria and considered costs and public comments.
- Alternative routes were identified by Ontario Hydro and reviewed with the public and government representatives.

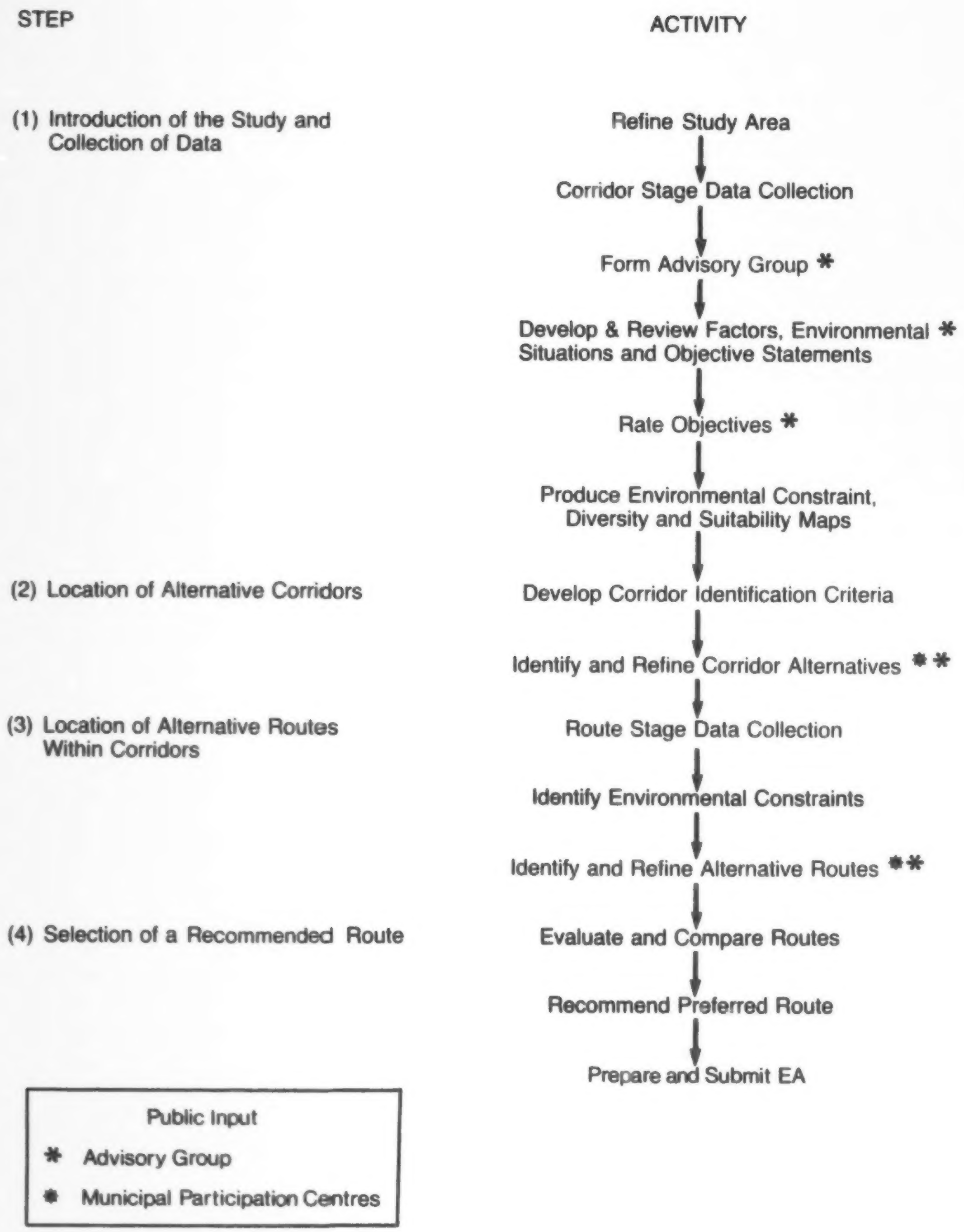

STEP
ACTIVITY
(1) Introduction of the Study and Collection of Data
Refine Study Area
Corridor Stage Data Collection
Form Advisory Group *
Develop & Review Factors, Environmental Situations and Objective Statements *
Rate Objectives *
Produce Environmental Constraint, Diversity and Suitability Maps
(2) Location of Alternative Corridors
Develop Corridor Identification Criteria
Identify and Refine Corridor Alternatives ✱*
(3) Location of Alternative Routes Within Corridors
Route Stage Data Collection
Identify Environmental Constraints
Identify and Refine Alternative Routes ✱*
(4) Selection of a Recommended Route
Evaluate and Compare Routes
Recommend Preferred Route
Prepare and Submit EA
Public Input
* Advisory Group
✱ Municipal Participation Centres

Figure 2.1
Route Selection Process

(4) Selection of a Recommended Route

- Qualitative and quantitative evaluations of the alternative routes were prepared based on the environmental and socio-economic factors, cost, technical considerations, and public comments. The alternatives were then compared and a recommended route selected.

- The recommended route and the alternatives were reviewed with the public and government representatives.

2.2 Public Involvement Programme

2.2.1 Purpose

The purpose of the programme was to ensure that those potentially affected by, or interested in the study, received information and had the opportunity to participate at each study step.

The objectives of the first study step were to inform the public of the study, provide background information, and outline future study activities and schedule; and to obtain a rating of the regional importance of land use and environmental resources within the study area.

At the second step, the objective was to give local residents the opportunity to review the corridor alternatives and provide local knowledge and opinion that would assist in refining the corridors and in identifying route alternatives.

At the third step, the objective was to encourage residents to review the route alternatives and provide information and opinions to assist in refining and comparing them.

At the last step, the objective was to inform the public of the recommended route, the reasons for its selection, document their concerns for possible adjustments to the route, and to outline the subsequent hearings and approvals process.

2.2.2 Programme Design

The programme was designed with both an information and an involvement component. The major vehicle for public involvement at the first step was the Advisory Group. This committee was comprised of representatives from municipal, provincial and federal levels of government and regional interest groups interested in the environment and land use within the study area.

At subsequent steps, Municipal Participation Centres (MPCs) were designed to encourage residents in each potentially affected municipality to review the study results and contribute to the route stage study. The MPCs were open house workshops, held in co-operation with local municipal councils, to which area residents were invited to contribute local information and opinion. They were planned to occur at key steps of the study process in each township or municipality potentially affected.

To ensure that information about the study was available, a number of different methods were employed.

- A mailing list was developed containing names of individuals and organizations. This list was updated as the study progressed and information was mailed out at key stages to all on the list.

- Information displays were set up at Ontario Hydro Area Offices in eastern Ontario.

- Through news releases and meetings, the local media was provided information on the study as it progressed.

- Advertisements in local newspapers and on radio stations were used to provide study information and notification of the MPCs.

- Meetings with municipalities, interest groups and individual property owners were held as requested to provide information on the study and to discuss specific concerns.

- Information and maps relating to the study were available at municipal offices, and municipal officials were briefed throughout the study.

2.3 Provincial Government Ministries

The provincial government ministries participated in the study by providing data, commenting on the study process, and reviewing the draft EA following "Guidelines For Pre-Submission Consultation" issued by the Ministry of the Environment. These guidelines suggest that the proponent consult with all ministries and others who will be participants in the formal review and decision-making process.

On September 15, 1982, a letter was sent to interested provincial ministries to request an official contact for the study and invite them to attend an introductory meeting in Toronto on October 5, 1982. At the meeting the study was introduced through a presentation on the project history, status, and handouts on the planned route stage study process. Ministries were invited to participate in the study by membership on the Advisory Group and to provide their comments on the study process. The following is a tabulation of the ministries contacted and those which designated a contact person.

Provincial Ministry Contacted	EA Contact Appointed (x)	On Advisory Group (x)
Agriculture and Food	x	x
Community and Social Services	-	-
Citizenship and Culture	x	-
Energy	x	-
Environment	x	x
Health	-	-
Industry and Trade	x	-
Intergovernmental Affairs	-	-
Municipal Affairs and Housing	x	-
Natural Resources	x	x
Transportation and Communications	x	-
Treasury and Economics	-	-
Labour	-	-
Tourism and Recreation	x	x

A second meeting was held on March 16, 1983 with the ministries who had appointed contacts. At this meeting the project status was reviewed, the alternative corridors were presented, the proposed information base for alternative route identification was presented and discussed and comments on the process were requested. An information package consisting of the following was distributed at the meeting or mailed with the notes of meeting to those ministries who had designated a contact but did not attend the meeting:

- Bulletin No. 1 - Eastern Ontario Study: Telecommunications
- Bulletin No. 2 - Eastern Ontario Study: Transmission
- Eastern Ontario Transmission Study Corridor Identification Update
- East Section Corridor Map (Scale: 1 inch = 2 miles)
- West Section Corridor Map (Scale: 1 inch = 2 miles)

The third meeting was held on November 30, 1983 to review ministries' comments to date. The alternative routes and telecommunications sites and the alternative route evaluation and comparison process were presented for discussion. All ministries were requested to provide any specific comments on the alternatives or the process prior to December 15 so that these could be considered in the alternative route and site comparisons and recommended route and site selection. An information package consisting of the following was distributed at the meeting or mailed with the notes of meeting to those ministries who had designated a contact but did not attend the meeting:

- Bulletin No. 3 - West Section Alternative Routes and Sites Identified;
- General Information on the Alternative Routes;
- Route Stage Data Types;
- General Guidelines for Route Identification;
- Telecommunications Study Information;
- Site Selection and Rejection Criteria for the Eastern Ontario Telecommunications Study.

3.0 THE ENVIRONMENT

3.1 The Study Area

The study area encompasses approximately 4,300 square kilometres. Included in this area are all or part of 30 municipalities within four counties and the Regional Municipality of Ottawa-Carleton. The study area is illustrated in Figure 3.1 and includes two major existing Ontario Hydro rights of way which were approved as part of the Plan Stage study area, namely:

- Lennox GS to Cataraqui TS

This Ontario Hydro owned right of way, which is approximately 209 metres wide, was acquired in 1973. The proposed 500 kV lines would occupy the area between the two existing 230 kV lines that are located near the edge of this right of way.

- Merivale TS to Hawthorne TS

This right of way is, for most of its length, owned by Ontario Hydro or on easement granted by the federal government. At present, 230 kV and 115 kV transmission lines use this right of way. The proposed 500/230 kV lines would be consolidated on new towers with the existing lines.

The boundaries of the study area were refined to exclude major areas of environmental constraint and human settlement, wherever possible. The western boundary parallels the existing transmission lines from the Lennox GS northward to Lavant Township. It excludes small towns and villages along Highways 38 and 509 (Hartington, Harrowsmith, Verona, Sharbot Lake) and lakes, wetlands and sensitive biological areas to the west.

The eastern boundary parallels the existing 115 kV transmission line between Storrington Township and Merivale TS in Ottawa. This boundary crosses the Rideau Canal system near Jones Falls and Smiths Falls, excludes the town of Richmond and then turns northeast in Goulbourn Township, and north in the City of Nepean.

The southern boundary parallels an existing pipeline right of way in Kingston Township to the intersection with the existing 115 kV transmission line in the Battersea Road area. This location excludes concentrations of development nearer Highway 401.

The northern boundary parallels the existing 230 kV line from Lavant Township to West Carleton Township, excluding the town of Almonte. The boundary follows Highway 417 in the Stittsville area, and provided an option of either locating a route through the Stittsville area or continuing along Highway 417. From the Bridlewood Subdivision to Merivale TS, the study area boundary parallels the existing 230 kV right of way.

3.2 Description of the Environment

The study area is composed of three major physiographic regions. The rugged Canadian Shield occupies the central and northwestern portions, and the relatively flat St. Lawrence Lowland and Ottawa Valley occupy the southern and northeastern portions, respectively.

The Shield and non-Shield areas provide the greatest contrast in terms of the visual landscape. The flat, untreed farmlands north of Richmond have a different visual character than the scenic views from forested, high hills found around Lavant Mountain. Between these two extremes in topography there are many types of landscapes which provide various visual amenities and which reflect a cultural record of land use development in Eastern Ontario. The Rideau Canal and associated landscapes are of prime importance to the region with landmark features, such as Westport Mountain becoming focal points.

The soils of the study area consist predominantly of sands and gravels on the Shield, and loams and clays on the St. Lawrence Lowland and the Ottawa Valley. The clay plains of the Ottawa Valley - St. Lawrence Lowlands are of marine origin.

The study area contains a viable farming industry, composed principally of dairy and beef cattle operations, and grain corn cash cropping. The most significant farming locations are associated with the fertile limestone till and clay plains of the lowlands.

The value of agricultural sales in eastern Ontario in 1981 was estimated at $440 million, or about 10 percent of province-wide sales. Approximately 20 percent of eastern Ontario's sales were generated from within the study area. Fifty-one percent of the agricultural sales were from dairy or beef cattle operations.

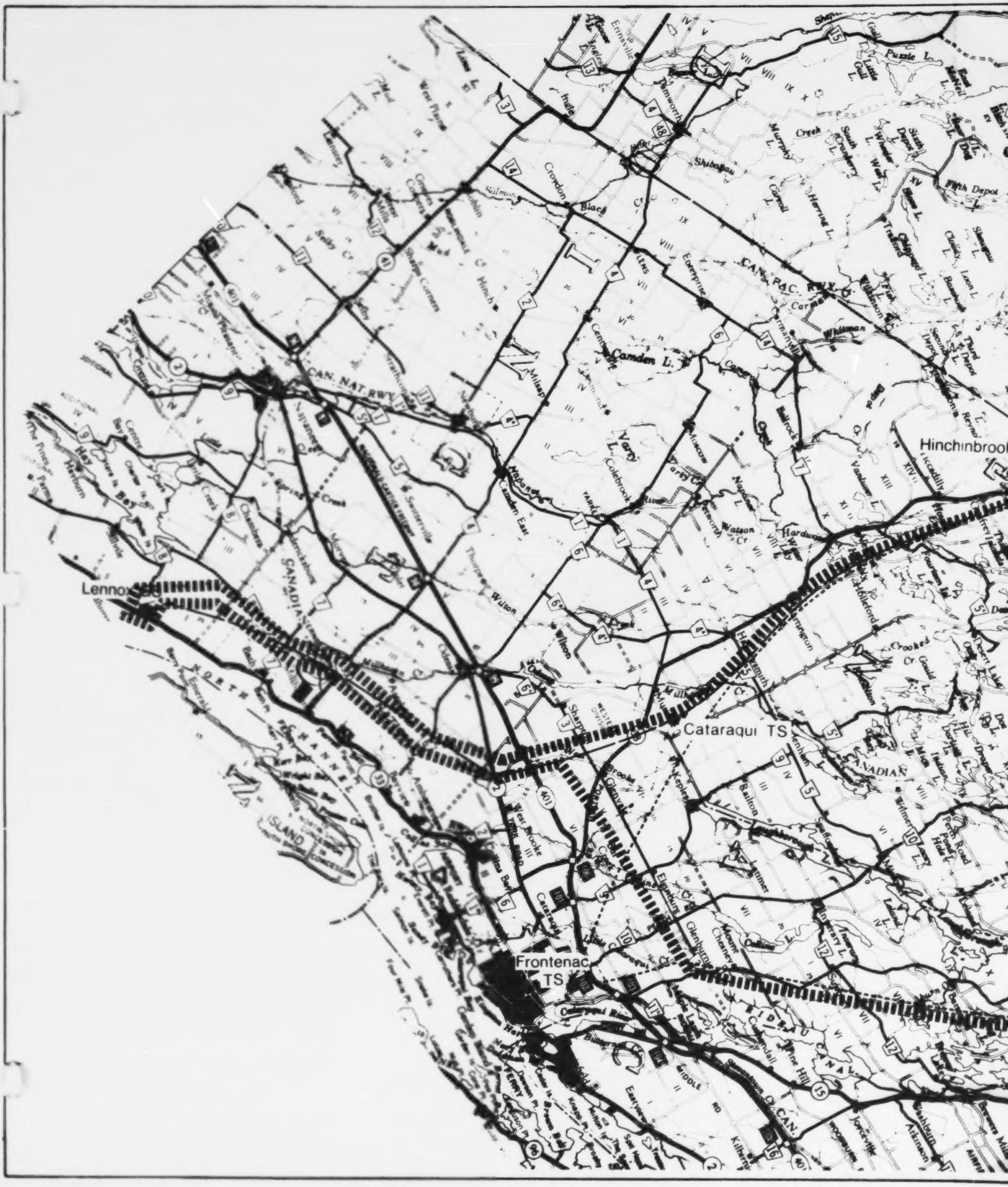
With the exception of farms in the Regional Municipality of Ottawa-Carleton (RMOC), the number of active farms in the townships of the study area decreased by 14 to 20 percent in the period from 1976 and 1981. The number of farms in the RMOC decreased by about 2 percent. Similarly, the size of farm populations declined over the 5-year period. This trend in eastern Ontario is consistent with the rest of the province. Farms within the study area, however, tend to be slightly larger than the provincial average.

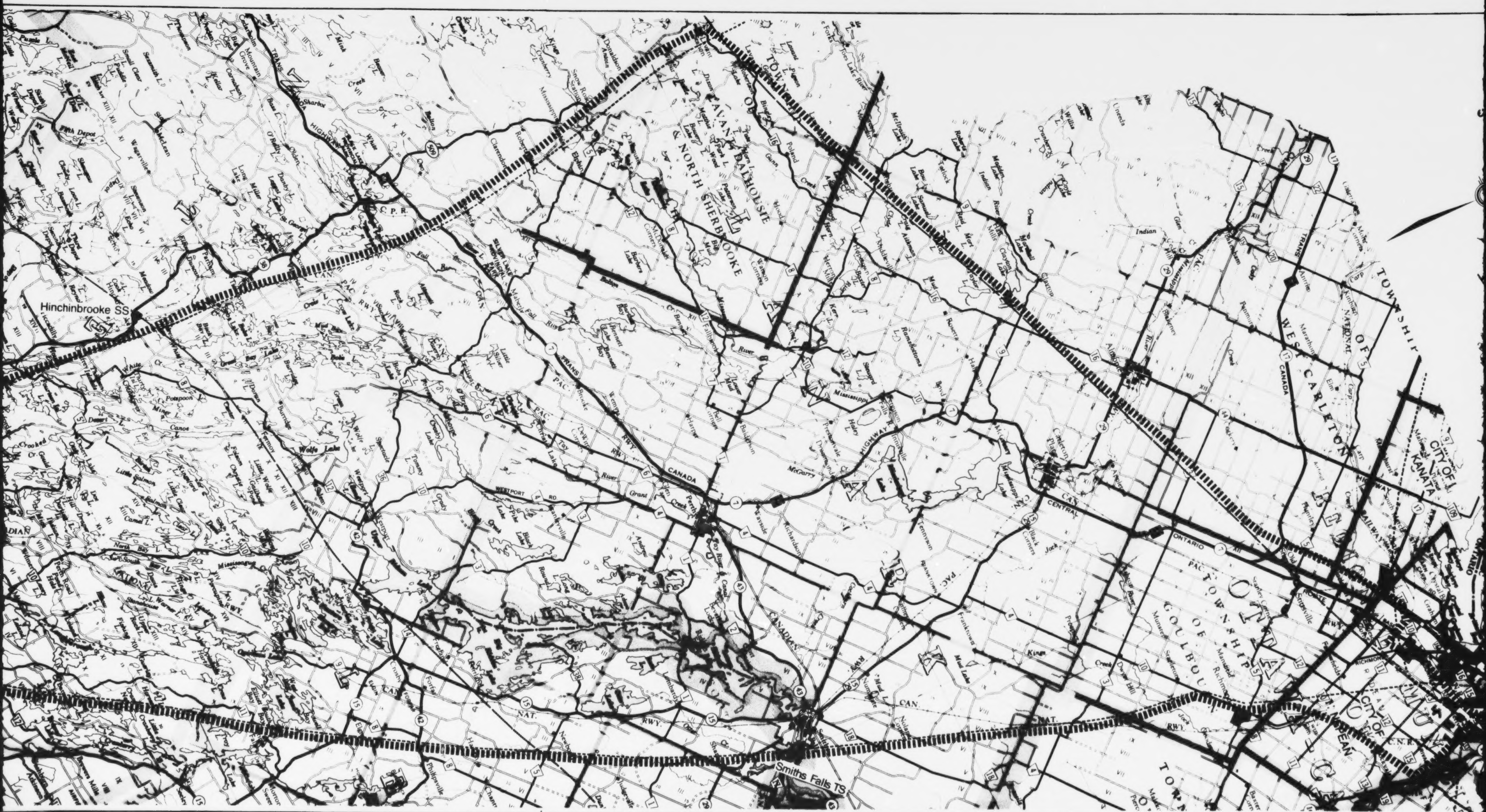
There are numerous lakes in the study area, primarily located on the Shield. They tend to be oriented in a northeast to southwest direction, reflecting both the direction of glacial movement during the Pleistocene Era and the resistance of the bedrock in the area. River courses also tend to be influenced largely by the nature of the bedrock through which they flow.

Pickerel, smallmouth bass and pike inhabit the warm water rivers and lakes, while the few remaining cold water lakes support a variety of trout species. The variety of fish species provides for good angling opportunities.

Deer are found throughout most of the study area. Other mammals such as wolf, beaver, bear and muskrat, occur throughout the Shield. Waterfowl and game birds such as grouse and woodcock are present.

Big game hunting (deer and bear), along with upland game and waterfowl hunting are important to the tourist industry. Trapping is also a factor in the regional economy. Wildlife viewing contributes to the recreational experience.


Lennox
Hinchinbrook
Cataraqui TS
Frontenac
TS
CAN. NAT. RWY.
CAN. PAC. RWY.
Camden L.
RIDEAU CANAL
NORTH CHANNEL


Hinchinbrooke SS
Smiths Falls TS
DALHOUSIE
& NORTH SHERBROOKE
TOWNSHIP OF WEST CARLETON
CITY OF KANATA
TOWNSHIP OF GOULBOURN
CITY OF NEPEAN
C.P.R.
CANADA
CENTRAL
ONTARIO
PAC.
NAT.
RWY.
C.N.R.
HIGHWAY
TRANS
NATIONAL
Wolfe Lake
Mississippi
McGarry
Kings
Richmond
Indian
Potspoon
Canoe
Crooked
Little Salmon
North Bay L.
Westport
Bolton
Fifth Depot
Sharbot

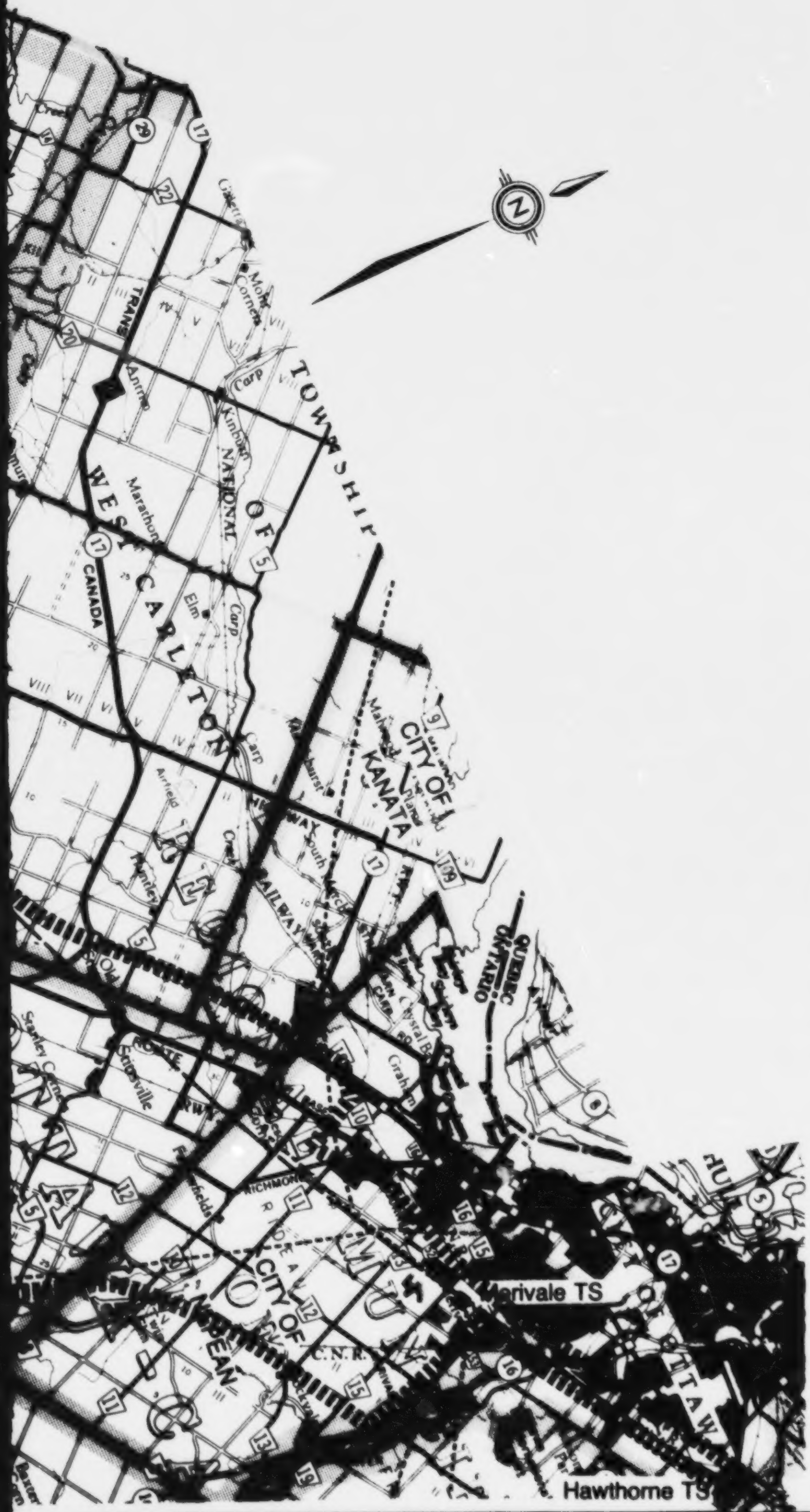

N
TOWNSHIP OF WEST CARLETON
CITY OF KANATA
CITY OF NEPEAN
CITY OF OTTAWA
HULL
QUEBEC
ONTARIO
TRANS CANADA HIGHWAY
RAILWAY
C.N.R.
Merivale TS
Hawthorne TS
Carp
Kinburn
Marathon
Antrim
Elm
Richmond
Stittsville
Stanley Corners
17
5
9
10
12
15
16
19
22
29
109

Figure 3.1

Eastern Ontario Study – West Section
Study Area Boundary

Legend

▮▮▮▮▮▮▮▮ Study area boundary

Scale: 1:250,000

As a result of local variations in soils and climate, vegetation varies throughout the study area. There is a wide range of coniferous and deciduous species, typical of the Great Lakes - St. Lawrence Forest. Forest resources include farm woodlots on the lowlands and hardwood and mixed-forest stands on the Shield. The forest industry in eastern Ontario supports primarily very small, single-industry communities, that employed less than one percent of the regional labour force in 1971. The timber harvested from woodlots and re-forested areas consisted of softwoods suitable for pulp and paper and hardwoods, used for veneers, board lumber and fuelwood. In 1978, there were an estimated 300 small-scale woodlot operations and 84 sawmill operations in the study area. Most of these woodlots are less than 20 ha and are part of larger farming units. The gross value of this wood in 1981 was estimated at $681,000.

Maple sugar bush operations are scattered throughout the study area, but are particularly significant to the economy of Lanark County, where in 1981 an estimated 250 farmers within the study area had maple syrup operations, with a total value of $780,000. Plantations have been established on both the lowlands and the Shield. Experimental plots of hybrid poplar are being planted throughout the region to complement the pulp and paper industry and a developing wood energy market in Ottawa.

Previous archaeological fieldwork has uncovered evidence indicating that man has lived in the area for over 11,000 years. This time period can be sub-divided into four basic periods, each associated with cultural changes in early man's development. Firstly, the Paleo-Indian Period (circa 9000 BC - 5000 BC), was characterized by small bands of wandering hunters and gatherers in the Frontenac Axis. Secondly, the Archaic Period (circa 5000 BC - 1000 BC), differed from Paleo-Indian in that they used distinctive copper and stone tools. Thirdly, the Initial Woodland Period (circa 1000 BC - AD 1000), marked the introduction of pottery. Finally, the Terminal Woodland Period (circa AD 1000 - Historic Period), was characterized by the introduction of corn agriculture and a more sedentary way of life.

It was not until the late 1700's that European settlement commenced in earnest with the influx of United Empire Loyalists from the United States. The 1800's witnessed a steady increase in local agricultural, forestry, commercial and industrial activity. By the end of the 19th century, however, the focus of the economy of eastern Ontario had begun to shift toward tourism and recreation.

The main population centres in the area are Kingston, Smiths Falls, Carleton Place, Perth, and the suburban Ottawa communities of Kanata and Nepean. In the past ten years, the population of the majority of the townships in the study area has grown at a faster rate than the provincial average.

There are an estimated 202,000 permanent residents in the eastern Ontario study area. Over 65 percent of this population is located in the cities of Kanata, Nepean, and in Kingston Township. The remaining 35 percent of the population or 70,000 people, are distributed over the remaining 24 townships. This rural population is composed of non-farm and farm populations. The rural non-farm population is numerically dominant.

More than 90 percent of the residents of the townships in the study area report English as their mother tongue.

During the summer months, the population within the study area increases as cottagers move into the area. In 1981, this population increase was estimated at 18,400 people. This seasonal population is concentrated in the central part of the study area, mainly Bedford, North Crosby, South Crosby, North Burgess, Bastard/South Burgess, North Elmsley, and South Elmsley townships. They originate mainly from the Toronto, Ottawa, and Kingston areas. This area is also popular with cottagers from the United States.

The population within the study area seems to be somewhat older than the provincial average. Townships such as Bathurst, North Crosby, South Crosby, and Bedford have quite large populations of the over-65 age group. This may be due to people retiring to rural centres or people retiring to their converted cottage properties.

The principal commercial, industrial and institutional developments are confined to the immediate Kingston and Ottawa areas. Agriculture and tourism are the major employment sectors in the regional economy.

While the precious metals of the Shield were more significant in earlier times, it is the industrial minerals and the aggregate resources, such as sand, gravel, and crushed rock, that are important today. The Eastern Ontario Planning Region produced six percent of the volume and five percent of the value (about $6 million) of sand and gravel produced in Ontario in 1980. With respect to crushed rock, eastern Ontario was responsible for 16 percent by volume and 13 percent by value (about $16 million) of the 1980 provincial crushed rock production.

In addition to the commercial and industrial uses to which the mineral resources have been applied, there are also numerous geologic sites and features throughout the study area that are recognized unique natural features. These include such occurrences as karst formations (limestone caves), the Holleford meteorite crater, and abundant fossil formations.

Tourism has become increasingly important to the area in terms of the economy and local employment until, today, it is the single-most important industry in eastern Ontario. Much of this is associated with cottaging, recreation on the Rideau Canal System, and the attractions in the Kingston and Ottawa areas.

In 1976, the total income generated by tourist expenditures in eastern Ontario was $986 million. (These expenditures were for the Eastern Ontario Planning Region, an area considerably larger than the study area. Nonetheless, it does provide some perspective on the value of tourism). Canadian visitors accounted for approximately 80 percent of tourist expenditures. American tourists accounted for less than 20 percent of the total. In 1976, tourism-related activity employed about 10 percent of the region's labour force.

Within the study area there are a variety of lifestyles as described in greater detail in Appendix B6. They include:

. urban dwellers who live and work in urban-centres such as Ottawa, Kingston, Smiths Falls, Perth, Almonte, Carleton Place, and Stittsville;

. ex-urbanites who have chosen to relocate in rural areas and commute regularly to jobs in the urban centres. This is most common in the urban fringes of Ottawa and Kingston;

- farmers who live and work primarily on family farms and regard the cities as service centres. The townships in which farmers represent a significant portion of the total population include: Lanark, North Crosby, Drummond, Ramsay, North Burgess, Oso and Bedford;

- cottagers who, mainly during the summer months, retreat to their cottages in primarily natural settings in the Rideau Lakes area; and

- individuals who have chosen to pursue an alternate lifestyle in a rural setting. The Farm, Brooke Valley, and Nature's Way are examples of such communities.

20

Line
Numbers

4.0 INTRODUCTION OF THE STUDY AND ALTERNATIVE CORRIDOR DEVELOPMENT

4.1 General

This section describes the process by which the study was introduced to the public, data were collected, and alternative corridors were developed.

4.2 Study Introduction and Announcement

In the fall of 1982, Ontario Hydro held introductory meetings with municipal officials within the study area. At these meetings, the history of the project, study process, and proposed public involvement programme were outlined. Emphasis was placed on how municipalities and the public could become directly involved with the Municipal Participation Centres. The concept of such centres held in each municipality at key study steps was supported by those contacted.

In November, 1982, following the release of the Joint Board Decision regarding the Plan Stage, the Route Stage study was formally announced to the public. On November 5, 1982, a communications plan was initiated that included distribution of a news release to study area news media, and a Project Backgrounder and covering letter were sent to all people on the study mailing list.

Throughout November, 1982, Ontario Hydro contacted municipalities within the study area and many organizations to provide background information on the study and outline the route stage study activities for the coming year. Ontario Hydro met with local media to provide information and answer any questions regarding the study. Briefings were also held with provincial elected officials during this period.

4.3 Formation and Role of the Advisory Group

During November, 1982, contacts were made with many regional and local organizations in order to form the Advisory Group. Letters of invitation were also mailed to provincial interest groups and to provincial government ministries who might be interested in participating.

The primary role of the Advisory Group was to assist Ontario Hydro in locating transmission corridors by providing a regional overview of the issues and concerns related to locating transmission lines.

To carry out this role, members were requested to:

- advise on the importance of criteria used to identify alternative corridors;
- act as liaison between the project team and their parent organizations;
- review and comment on key decisions throughout the Route Stage study.

Criteria for membership were set as follows:

- Advisory Group members should be representative of municipalities, provincial or federal agencies, regional interest groups, or the private sector who had an interest in the study area;

- Advisory Group members should be available to attend a total of five meetings within twelve months;

- if an individual not representing an organization expressed an interest in being on the Advisory Group, the individual was invited to attend meetings as an observer and could become an official member if the group accepted the individual.

The Advisory Group consisted of thirty members (refer to Appendix C1.1). The group met in Rideau Ferry on November 20, 1982, for orientation and to review and confirm their terms of reference and membership. The overall study process was discussed and a binder of study information was provided to them.

Further activities of the Advisory Group are outlined in subsequent sections of this report.

4.4 Corridor Step Data Collection

Land use and environmental data were collected under sixty-eight categories, and mapped at a scale of 1:50,000. Municipal official plans and zoning by-laws were reviewed in terms of existing and proposed land uses. Information was gathered from published and unpublished sources, federal, provincial and municipal government agencies, local groups, and organizations, and through field review and air photograph interpretation (refer to Appendix B1).

The study area was divided into 500 m x 500 m cells and the data stored in a computer on this basis to aid in processing and graphic illustration. The grid system was referenced to the Universal Transverse Mercator system.

Socio-economic information was available on a township basis. Some economic data were provided for the Eastern Ontario Planning Region as defined by the provincial government (refer to Appendix B6) rather than on the study area basis.

4.4.1 Development of Factors, Environmental Situations and Objective Statements

In order to examine the individual components of the land use and environment, a large amount of diverse environmental information was collected and organized into nine general factor categories. They were:

- the Agricultural Resources factor, which considered the soil capability for agriculture in the study area, and the present agricultural land use patterns, reflecting the type of farming operations;

- the Appearance of the Landscape factor, which considered the visual characteristics of the landscape, and the potential for visibility of transmission lines in various settings;

- the Biological Resources factor, which considered both the floral and faunal components of the terrestrial and aquatic environment, such as deer concentration areas, heronries, unique/sensitive plant and animal communities, wildlife habitat, spawning areas and wetlands;

- the Forest Resources factor, which considered the resource-use aspects of the forest, based on the species composition, the capability of the land to produce renewable forest resources, the degree of investment and management in the land, and the use of existing stands for research plots and maple sugar production;

- the Heritage Resources factor, which considered the prehistory and history of the study area through an analysis of known and potential archaeological sites, recognized historic buildings and settlements, and significant cultural landscapes;

- the Human Settlement factor, which considered the predominantly man-made environment with its associated residential, industrial, recreational, commercial and institutional facilities, as well as related transportation and communication facilities. Included were proposed (but not yet developed) land uses and facilities;

- the Mineral Resources factor, which considered the mineral aggregate industry through an analysis of existing and planned extractive operations (pits, quarries and mines) and potential reserve areas. It also included those geologic sites with recognized value;

- the Recreation Resources factor, which considered present and proposed uses of public, private, commercial and institutional sites in terms of their facilities and associated recreational activities;

- the Engineering/Cost Constraint factor, which considered those aspects of the natural environment (large water bodies, steep slopes, unstable Leda clays) which may pose a significant physical or cost constraint to the building of transmission lines.

Thirty-nine environmental situations within the nine factor categories were developed from the data collected. These situations identified specific environmental characteristics which were recognized as important within the study area and which could be affected by transmission facilities.

An objective statement was then defined for each of the identified situations. The objective statement included a directive to avoid the situation, a description of the data types used to develop the situation and its general location in the study area, an explanation of the value of the situation to the local and/or regional land use and natural resource base, a description of the possible transmission line effects on the situation and, finally, a summary of the possible mitigation measures which could minimize expected effects.

A more detailed description of the objective statement format and criteria is found in Appendix B2 while the environmental factors and objective statements are described in Appendix B3. The associated factor maps (illustrating the geographical location of the situations for each factor) are found in Appendix B4.

4.4.2 Rating of Objectives

Since it was not possible to avoid all of the identified land use and environmental situations, it was necessary to establish them as relative priorities to be avoided within and among the factors, based upon the information contained in the objective statements. In order to do this, a four step rating scheme was employed jointly by the Advisory Group and Ontario Hydro (refer to Figure 4.1). The criteria used to establish the relative level of priority among objectives is presented in Appendix B5.1.

The rating scheme had numerous planning advantages:

- it integrated a list of land use and environmental information in a systematic and manageable format;
- it incorporated diverse public and professional viewpoints;
- it established explicit criteria to develop priorities;
- it quickly identified the key environmental concerns in the study area.

The individual Advisory Group members rated the level of importance, or resource value for each objective. The results were tabulated and an Advisory Group average was obtained for each objective. These results were discussed among the Advisory Group members and individuals explained their rationale for their ratings. After an exchange of ideas, a second rating was undertaken and the Advisory Group average was again derived (refer to Appendix B5.2).

Concurrently, Ontario Hydro went through a similar procedure to rate the possible transmission line effects in the study area. The summary of possible effects for each objective is presented in Appendix B5.3.

To achieve an overall rating for each objective, the joint Advisory Group - Ontario Hydro resource values and possible effects ratings were combined (refer to Appendix B5.4).

Once the objectives had been rated, they were grouped into nine constraint levels (refer to Table 4.1) for illustration on a constraint map. It was determined that these levels produced the most functional differentiation of linear patterns of relative constraint when displayed in map form.

4.4.3 Constraint, Diversity and Suitability Maps

Three land use and environmental composite maps were developed to assist in the location of alternative transmission corridors.

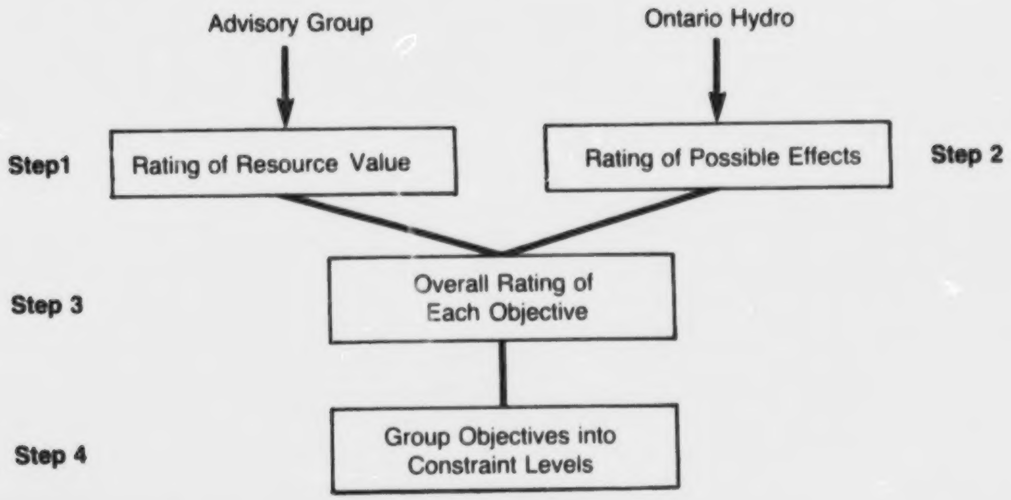

Advisory Group
Ontario Hydro
Step1
Rating of Resource Value
Rating of Possible Effects
Step 2
Step 3
Overall Rating of Each Objective
Step 4
Group Objectives into Constraint Levels

Figure 4.1
Rating of Objectives

Table 4.1

Eastern Ontario Study – West Section
Rated Objectives by Constraint Levels

LEVEL	OBJECTIVE	CUMULATIVE % AREA COVERAGE
Level 1	• Existing urban settlements • Federal, provincial and conservation area parks • Lakes and major navigable waterways • Biological areas considered to be rare, unique, sensitive or significant • Experimental forest areas and maple sugar bush operations	18.6
Level 2	• Sensitive/unique geologic features • The viewshed of the Rideau Canal System and Westport Mountain • Existing rural settlements and cottage developments • Specialty crop production areas and CLI class 1 soils in agriculture	28.9
Level 3	• Confirmed archaeological sites and known historical routes and sites • Intensive management forest areas • Existing institutional, commercial and industrial facilities • Biologically significant wetlands	38.9
Level 4	• CLI soil capability classes 2, 3 in agriculture • Fish and wildlife protection/management areas • Existing private, commercial and public recreation facilities	48.0
Level 5	• Viewsheds of cottage lakes • Approved residential and cottage developments • Active quarries	55.5
Level 6	• Landscapes characterized by high hills • Deer winter concentration areas • Productive forest lands with valuable species of mature or all-aged stands • Active pits	62.9
Level 7	• Productive forest lands with valuable species of immature or young stands • Viewsheds of existing settlements • Viewsheds of designated linear recreation features	71.0
Level 8	• Provincial park and conservation area reserves • CLI soil capability class 4 in agriculture • Cold and warm water fisheries • Potential archaeological sites and areas • Landscapes characterized as hilly • Waterfowl habitat	81.0
Level 9	• Wetlands with no identified biological information • Geologic sites and features with recognized value • Ridge farm landscapes • Areas of high sand and gravel reserve and industrial mineral potential • Representative cultural landscapes • Productive forest lands with intermediate value and low value species of all ages • CLI soil capability classes 5, 6 in agriculture	90.7

- Constraint Map (Figure 4.2)

An environmental constraint map was prepared by overlaying and shading the mapped situations from each factor map in established level of overall constraint. This map was used as the base to develop linear pathways through areas of relatively lower level constraints. In some instances, all identified constraints could be avoided by corridors, while in others, it became necessary to pass through higher constraint areas in order to connect the terminal points.

- Diversity Map (Figure 4.3)

An environmental diversity map was prepared to display the number of identified situations occurring in any given portion of the study area. This map was used to locate corridor segments in areas of uniform constraint where an 'edge' between single and multiple situations could be identified. The diversity map was particularly useful in urban areas and along the agriculture-forest lands interface.

- Suitability Map (Figure 4.4)

A suitability map was developed to display existing transmission facilities, other linear severances, and the fabric of the land. It was used to define corridor segments parallel to existing linear facilities, and parallel to the fabric of the land, so that new diagonal severances could be minimized. This map was particularly useful in some townships, but less so where lot and concession patterns between townships were not oriented in an uniform direction.

4.5 Identification of Alternative Corridors

The alternative corridors are shown in Figure 4.5.

At the outset, all existing bulk transmission lines in the study area were considered as possible corridors. All corridor alternatives eventually incorporated a portion of an existing right of way for part of their lengths.

New corridors were drawn by Ontario Hydro using the constraint, diversity, suitability, topographic and factor maps. The constraint map was used as the base to locate corridors through areas of low environmental constraint. The ability to avoid any land use and environmental constraint was dependent upon its location in the study area and its proximity to neighbouring constraints. The diversity, suitability and factor maps along with topographic maps were used to modify and refine the preliminary locations.

Through application of corridor identification guidelines (refer to Table 4.2), use of the land use and environmental maps, knowledge of the area and several group discussions, a series of alternative corridors were developed. While attempts were made to adhere closely to the guidelines, in certain instances they may have been violated to achieve the best overall alignment.

In January 1983, Ontario Hydro met with Advisory Group members to review the preliminary corridor locations. Based upon comments received, and further field study by Ontario Hydro, the corridor alternatives were refined. The corridors represented a reduction in the overall study area of 73 percent, to an area of about 970 km^2.

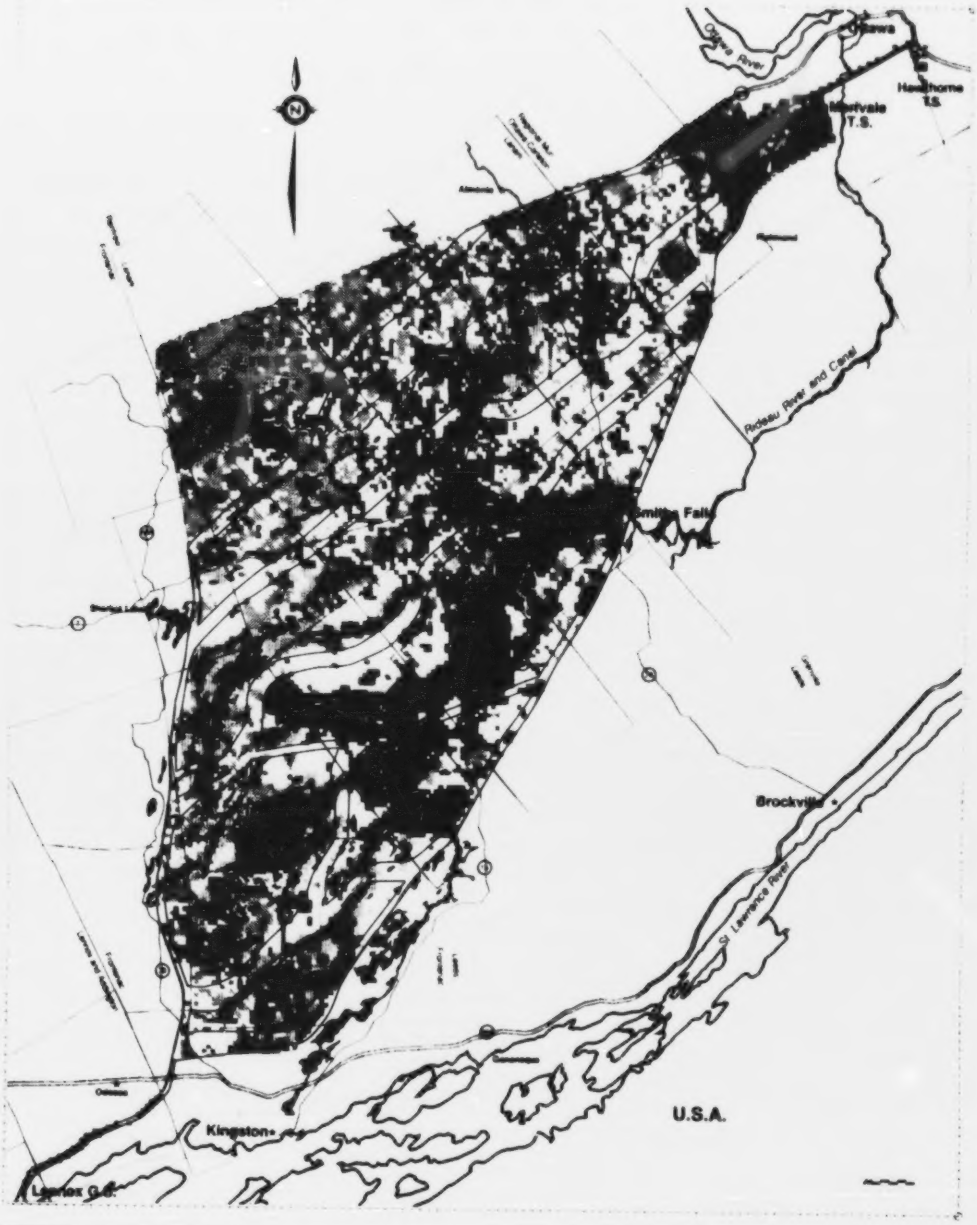


Figure 4.2 Environmental Constraint Map

Legend

■	Existing urban settlements Federal, provincial and conservation area parks Lakes and major navigable waterways Biological areas considered to be rare, unique, sensitive or significant Experimental forest areas and maple sugar bush operations
■	Sensitive unique geologic features The viewshed of the Rideau Canal System and Westport Mountain Existing rural settlements and cottage developments Specialty crop production areas and CLI class 1 soils in agriculture
■	Confirmed archaeological sites and known historical routes and sites Intensive management forest areas Existing institutional, commercial and industrial facilities Biologically significant wetlands
■	CLI soil capability classes 2, 3 in agriculture Fish and wildlife protection management areas Existing private, commercial and public recreation facilities
▨	Viewsheds of cottage lakes Approved residential and cottage developments Active quarries
▨	Landscapes characterized by high hills Deer winter concentration areas Productive forest lands with valuable species of mature or all-aged stands
▨	Productive forest lands with valuable species of immature or young stands Viewsheds of existing settlements Viewsheds of designated linear recreation features
□	Provincial park and conservation area reserves CLI soil capability class 4 in agriculture Cold and warm water fisheries Potential archaeological sites and areas Landscapes characterized as hilly Waterfowl habitat
□	Wetlands with no identified biological information Geologic sites and features with recognized value Ridge farm landscapes Areas of high sand and gravel reserve and industrial mineral potential Representative cultural landscapes Productive forest lands with intermediate value and low value species of all ages CLI soil capability classes 5, 6 in agriculture

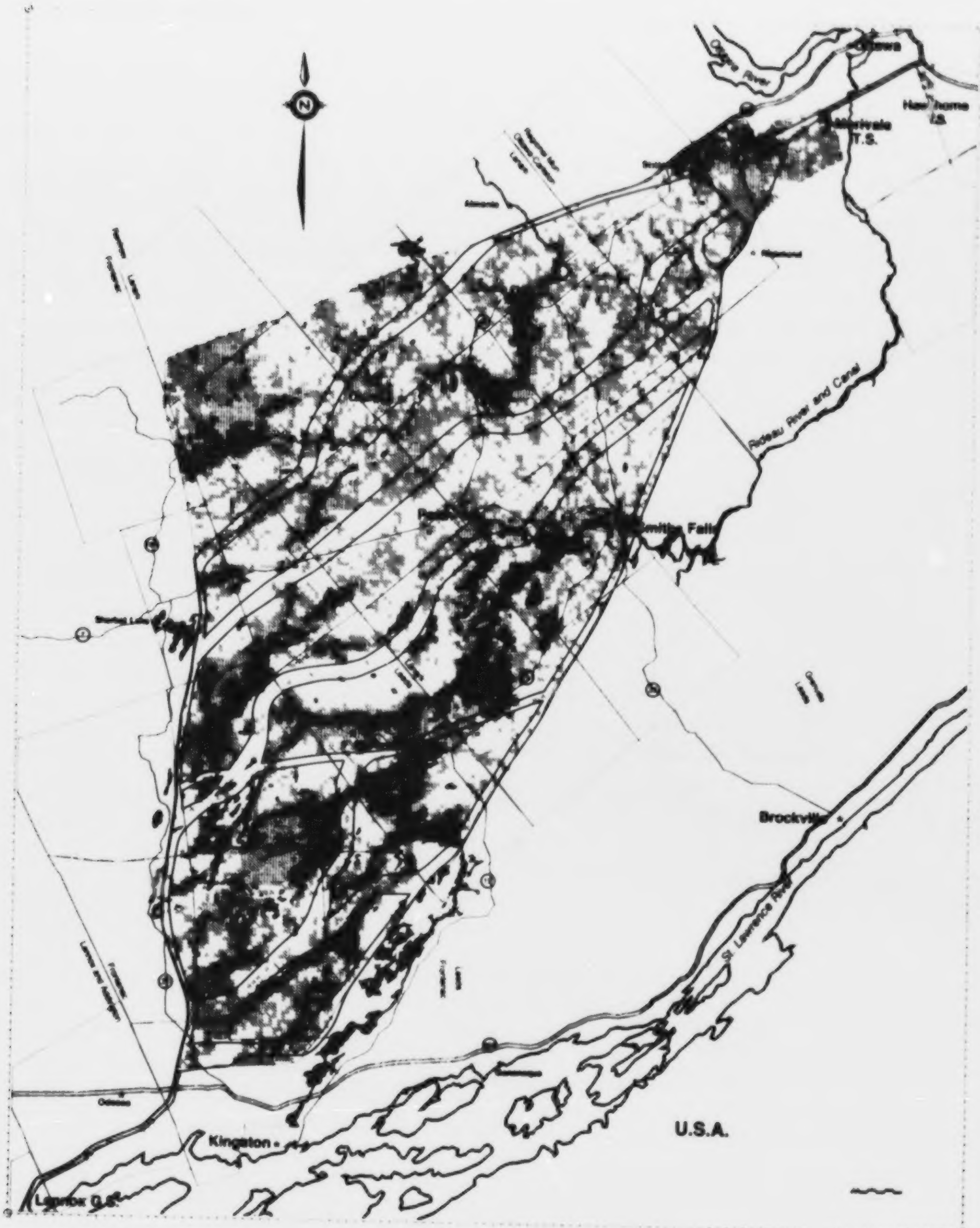
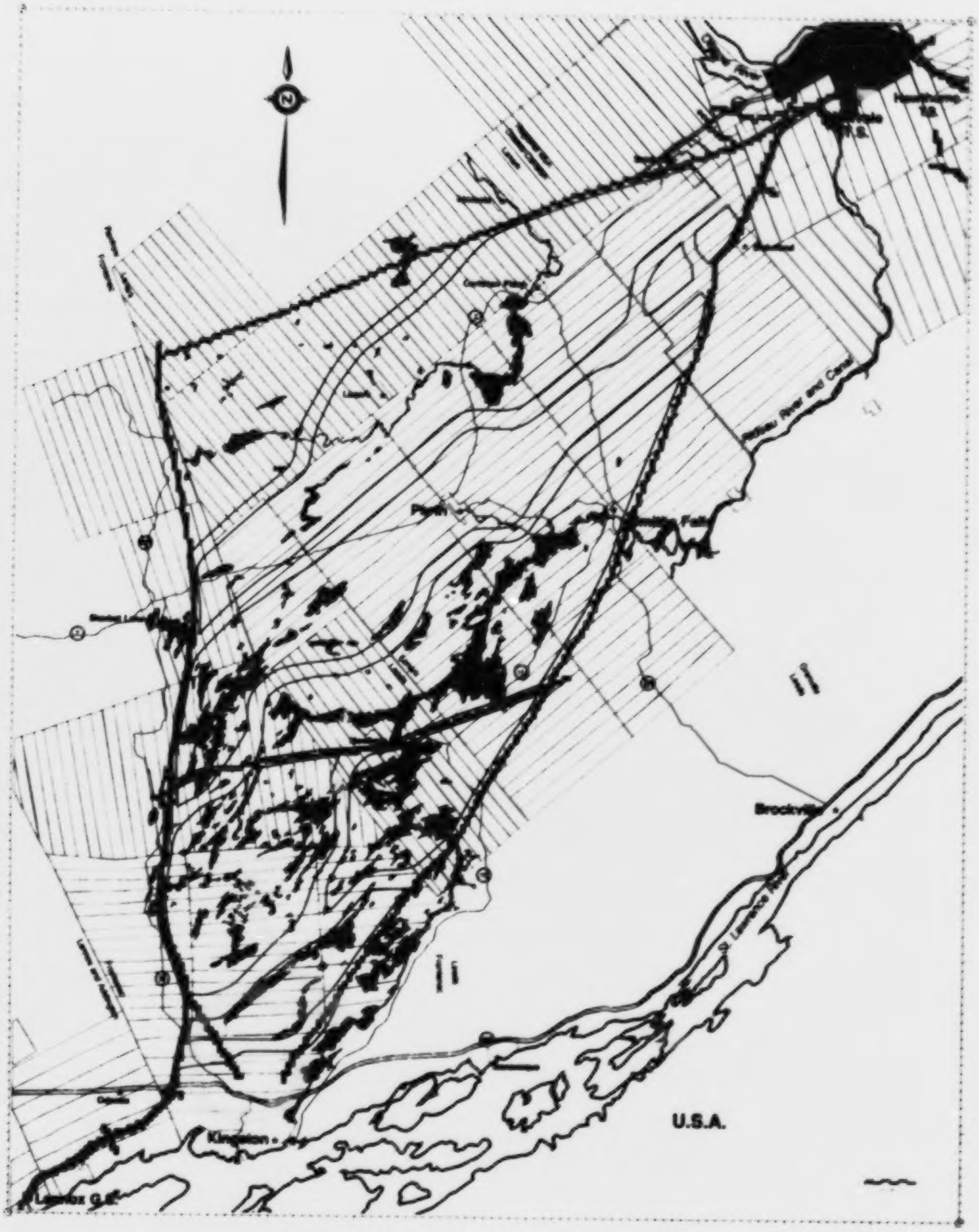

N
Ottawa
Ottawa River
Hawthorne T.S.
Merivale T.S.
Rideau River and Canal
Smiths Falls
Brockville
St. Lawrence River
Kingston
U.S.A.
Lennox G.S.

Figure 4.3 Environmental Diversity Map

Legend

- □ 0 Situations Cell
- □ 1 Situations Cell
- ▨ 2 Situations Cell
- ▨ 3 Situations Cell
- ■ 4 Situations Cell
- ■ 5 Situations Cell
- ■ 6 Situations Cell



N
T.S.
Rideau River and Canal
Perth
Brockville
St. Lawrence River
U.S.A.
Kingston
Lennox G.S.

Figure 4.4 Suitability Map

Legend

≡ Concession lines within townships

▬ Existing bulk transmission lines

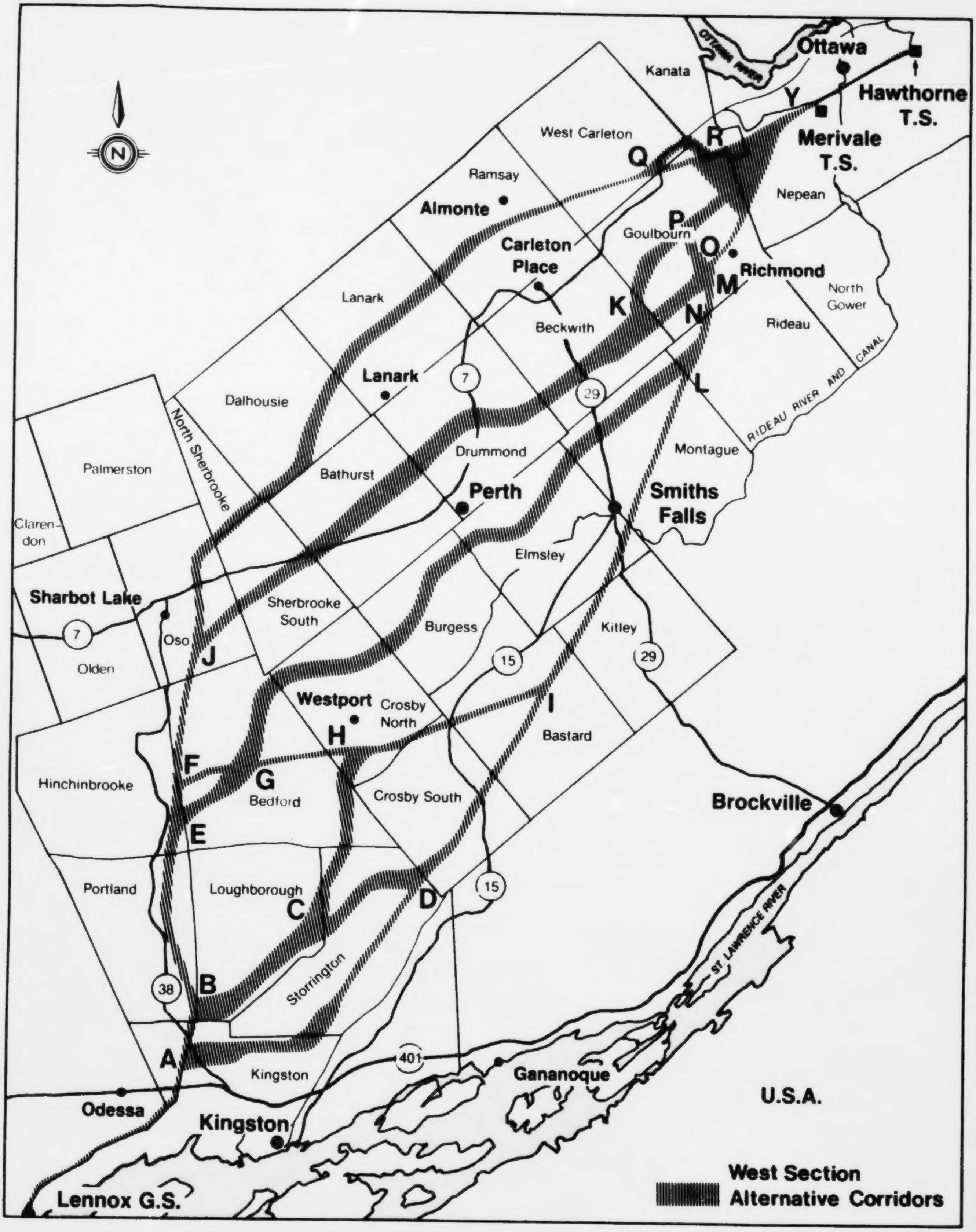

N
Ottawa
Hawthorne T.S.
Merivale T.S.
Kanata
Ottawa River
West Carleton
Ramsay
Almonte
Carleton Place
Goulbourn
Richmond
Nepean
North Gower
Rideau
Lanark
Beckwith
Dalhousie
Drummond
Bathurst
Perth
Montague
Smiths Falls
Rideau River and Canal
Palmerston
North Sherbrooke
Clarendon
Sharbot Lake
Oso
Olden
Sherbrooke South
Elmsley
Burgess
Kitley
Westport
Crosby North
Bastard
Hinchinbrooke
Bedford
Crosby South
Portland
Loughborough
Storrington
Kingston
Odessa
Gananoque
Brockville
St. Lawrence River
U.S.A.
Lennox G.S.
7
29
15
38
401
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
Y
West Section Alternative Corridors

Figure 4.5
Alternative Corridors

TABLE 4.2

Corridor Identification Guidelines

- Alternative corridors should be located to connect the vicinity of Cataraqui TS with Merivale TS in the City of Nepean.
- Alternative corridors should be located to minimize the overall length of line and the number of turns required.
- Alternative corridors should be located to avoid relatively higher environmental constraint areas wherever possible.
- Alternative corridors should be located to avoid areas of greater environmental diversity. Where broad areas of similar constraint and diversity are encountered, corridors should be located wherever an 'edge' can be identified in the land use pattern.
- Alternative corridors should be located to follow the fabric of the land (lot and concession pattern).
- Alternative corridors should be located with regard for officially stated or approved land use policies or regulations.
- Alternative corridors should be located to avoid exclusion zones of airports, DND installations and telecommunications facilities.
- Alternative corridors should be approximately 1500 m wide (about one concession) in areas where there are no existing transmission lines, and approximately 500 m wide where paralleling existing facilities.

Line Numbers

4.6 Description of Alternative Corridors (refer to Figure 4.5)

Along the western edge of the study area between Highway 2, south of point A, to a point north of Highway 7 in Oso Township, a corridor parallels the existing transmission lines (ABEFJ). A 115 kV transmission line is paralleled along the eastern edge of the study area (DILMOY) which provides an alternative which passes through an area of high population density in Storrington Township and crosses over the Rideau Canal at narrow points in the system. An alternative (JQRY) was developed along the northern edge of the study area that parallels an existing line through Ramsay and West Carleton townships. Finally, an alternative corridor segment (FGHI) was developed to parallel the existing 230 kV transmission lines between Hinchinbrooke and Bastard townships as a means of connecting alternatives from the west and east sides of the study area, in an area that avoids the numerous large lakes on-shield, and uses an existing transmission line crossing of the Rideau Canal.

Part of an existing pipeline is paralleled in Kingston Township as a means of joining with the corridor along the east edge of the study area while, at the same time, avoiding the small communities of Shannons Corners, Elginburg and Glenburnie.

Alternative corridors (BCD and BCH) were developed in the south central portion of the study area that avoid, to a greater extent, population concentrations and areas of agricultural land use. They also avoid the numerous lakes on the Canadian Shield, and provide an alternative that was not dependent upon the use of existing transmission rights of way in the southern portion of the study area.

The alternative corridor (EGL) through Bedford, North Crosby, and North Burgess townships crosses the Canadian Shield in an area of relatively low environmental constraint and low population density. The corridor passes between many lakes until it reaches Perth, at which point the terrain becomes flatter, agriculture becomes the dominant land use and rural population concentrations increase.

The corridor alternative (JK) through Oso, South Sherbrooke, Bathurst, Drummond and Beckwith townships passes through an area of relatively low environmental constraint and took advantage of the fabric of the land. In Drummond Township, the corridor follows the agriculture-forest land interface in the vicinity of the Blueberry Marsh and turns southeasterly below Mississippi Lake. The corridor branches out in Goulbourn Township in order to either link up with the existing transmission right of way (KNOY) or to allow for the development of a new right of way (KPRY) into the Ottawa area.

The northern corridor (JQ) passes through an area of rugged, heavily forested terrain. While it was not possible to use the fabric of the land to advantage beyond the North Sherbrooke and Dalhousie township line, the corridor avoids most small rural communities in Dalhousie and Lanark townships.

The study area in the vicinity of Ottawa was left open to allow for further detailed data collection and subsequent comments from federal, provincial and municipal officials and property owners.

In all cases, there was an effort to minimize the general cost of the transmission facilities by reducing the number of angles in the corridors and by minimizing the overall distance between terminal points.

4.7 Public Review of Corridors

On March 11, 1983, Bulletin #2 was sent to those on the mailing list. It contained information on the study status, a map of the corridors and a schedule for all MPCs. Advertisements promoting the centres were carried in study area newspapers and selected local radio stations.

On March 12, 1983, the Advisory Group met to review the corridors. The group generally agreed with their location and requested another meeting in the summer to review the results of the MPCs.

The first round of 24 MPCs were held during March, April and May of 1983. Study information and maps were displayed and Ontario Hydro staff were in attendance to answer questions and assist the public in their review of the materials. Comment forms were available to document public concerns and suggestions. Each MPC was open to the public from 7:00 to 10:00 pm with an earlier session scheduled for council members. Council members were encouraged to remain during the evening session.

Throughout the seven week MPC schedule, over 2,300 people, an average of approximately 100 per municipality, attended. Public information was recorded on both the comment form and maps.

In several townships there were requests tc turn the MPC into a formal meeting with Ontario Hydro answering questions from the audience. In most municipalities, such meetings were held with the township reeve acting as chairperson.

Municipal resolutions which were passed on to Ontario Hydro are included in Appendix C3.

The comment form (Appendix C2.3) served three purposes:

- to supplement locational information that was recorded by the public on the aerial mosaics;
- to provide a written documentation of the issues and concerns of the public; and
- to provide general information on guidelines for locating rights of way.

The analysis of public comments involved reviewing all letters, phone calls, notes of field meetings, and comment forms. Any specific locational concerns were identified, as well as general issues and concerns that were not related to the location of facilities.

Over 1400 individual comments from 540 comment forms were coded and the results documented.

The issues/concerns raised most often on the comment forms were:

- avoid prime agricultural land;
- avoid private homes and property;
- use existing rights of way;
- avoid populated areas;

- potential for contamination of water - wells, lakes;
- avoid woodlots;
- potential for devaluing recreational property;
- need for the project;
- avoid maple sugar bushes;
- electrical effects on humans and animals.

The analysis of letters, and phone calls indicated the same general concerns as those found on the comment forms. Generally, there was support for minimizing new rights of way and avoiding areas of human settlement and natural areas.

In addition to the issues/concerns raised and specific information provided by the public, there were also several suggestions put forth by the public for new or modified corridors (refer to Figure 4.6). In each case, the suggestions were reviewed as follows:

(1) At the North Elmsley Township MPC, several residents questioned why the corridor curved to the south in the Tay Marsh area. Ontario Hydro reviewed its information and decided that a more direct alternative through Concession 9 and 10 would also be included.

(2) At the South Elmsley/Kitley township MPC, residents in the vicinity of the Highway 29 crossing expressed concern about the possible affect on their homes if the proposed facilities followed the existing 115 kV line. Ontario Hydro agreed to study a slight diversion to the south.

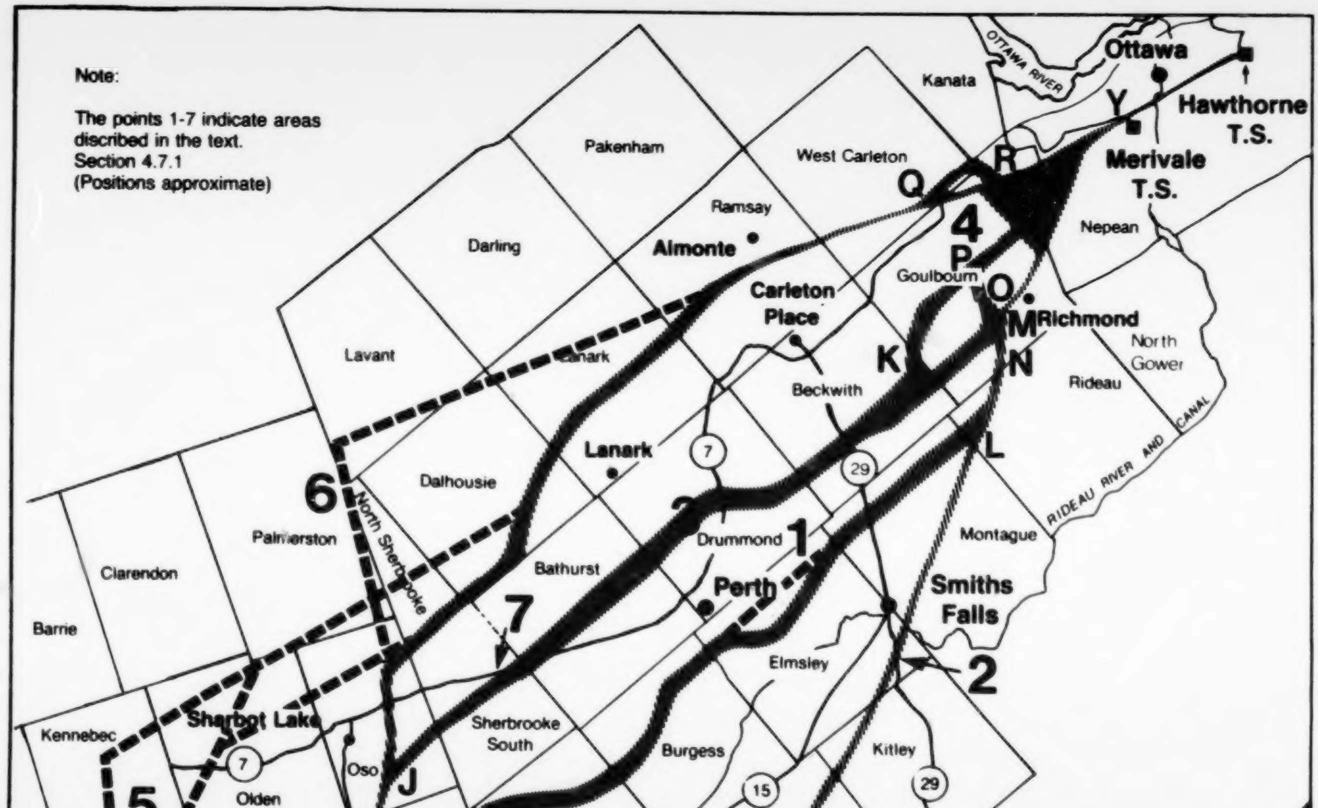
(3) At the Drummond Township MPC, several residents questionned why the corridor did not include more of the Blueberry Marsh. Ontario Hydro reviewed the information and agreed to study an alternative through the marsh.

(4) The Ottawa/Carleton Ontario Federation of Agriculture (OFA) requested that Ontario Hydro study a route alignment north of Concession 7 in Goulbourn Township that followed a minor ridge of rough land that bordered the prime agricultural area. Ontario Hydro agreed to study the proposal.

(5) One alternative corridor was proposed that involved proceeding north from the Lennox GS, outside the study area. This proposal was reviewed and Ontario Hydro concluded that the existing corridors that used the Lennox GS to Cataraqui TS right of way were preferred for the following reasons:

   - The proposal would require a third major egress through Lennox and Addington County and would not be in compliance with the county's draft official plan which has provided for, and based decisions on, the proposed lines being located on the Lennox GS to Cataraqui TS right of way.

   - The proposal would establish a new diagonal severance through agricultural land for a distance of about 35 km. By comparison, the existing Ontario Hydro owned right of way would involve at least 28 km of land already purchased to locate these lines.


Note:
The points 1-7 indicate areas discribed in the text. Section 4.7.1 (Positions approximate)
Ottawa
Hawthorne T.S.
Merivale T.S.
Kanata
Ottawa River
West Carleton
Pakenham
Ramsay
Darling
Almonte
Carleton Place
Goulbourn
Richmond
North Gower
Nepean
Lavant
Lanark
Beckwith
Rideau
Rideau River and Canal
Dalhousie
Palmerston
North Sherbrooke
Drummond
Montague
Clarendon
Bathurst
Perth
Smiths Falls
Barrie
Elmsley
Kennebec
Sharbot Lake
Sherbrooke South
Burgess
Kitley
Olden
Oso
Westport
Crosby North
Bastard
Hinchinbrooke
Bedford
Crosby South
Brockville
Sheffield
Portland
Loughborough
Camden
Storrington
St. Lawrence River
Ernestown
Kingston
Gananoque
U.S.A.
Odessa
Lennox G.S.
1
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38
401
N
Alternative Corridors identified by Ontario Hydro
Suggested by the Public

Figure 4.6

Corridor Alternatives and Modifications Suggested by the Public

- The proposal would reduce the possibility of using existing rights of way when compared to the Ontario Hydro proposed corridors.

- The proposal would have higher costs due to the additional length and difficult access for construction and maintenance.

(6) Another suggestion put forth at several MPCs was that Ontario Hydro include a corridor that would follow the existing transmission lines around the northwest corner of the study area in Lavant Township. Ontario Hydro reviewed this proposal and concluded that it not be considered further because it was the longest alternative by about 10 km, and more costly.

(7) A proposal was also received to modify the corridor in South Sherbrooke and Bathurst townships in the area of Silver Lake and McGowan Lake. Ontario Hydro's review concluded that these modifications would have higher cost, and greater visual and biological impacts than the original corridor. As a result it was not considered further.

Following the MPCs, Ontario Hydro organized and analyzed the public comments received and followed up on correspondence. Follow-up activities involved phone and letter contact as well as numerous field visits to check local concerns. Names of all those attending the centres and those who wrote or phoned regarding the study were added to the study mailing list.

On June 25, 1983, a meeting was held with the Advisory Group to review the MPC results (refer to Appendix C1.3).

Line
Numbers

5.0 ALTERNATIVE ROUTE DEVELOPMENT

5.1 General

Once corridors were identified, the next step involved the location of alternative routes. These alternative routes represented the locations considered most suitable for the proposed transmission lines. The alternative routes were continuous linear areas which represented the approximate locations for the right of way.

The route alternatives were initially located by Ontario Hydro. Additional guidance was obtained from comments and comment form responses received from the public at the MPCs held in March and April of 1983.

5.2 Route Step Data Collection

5.2.1 Land Use and Environment

Land use and environmental data were collected within and near all corridors, and were mapped at a scale of 1:15,000. In total, 45 data types were inventoried in detail, and were presented on a series of airphoto mosaic base maps according to each factor category.

The types of information collected and mapped for the route step were similar to those gathered for the corridor step (refer to Appendix B1), but by virtue of the smaller study area, and the larger map scale, the information was mapped more precisely and in greater detail.

Initially, the information gathered at the corridor step was reviewed, and some data were updated and re-mapped at the 1:15,000 scale. New information was also collected and mapped to assist in the location of specific route alignments.

To assist in the collection and verification of the data, an airborne video survey of the corridors was undertaken in May, 1983. Continuous ground coverage was obtained using a video cassette recording camera mounted beneath a small airplane. The imagery was used to identify building sites, forest cover types, agricultural land use patterns and wetlands; especially in areas of limited ground access.

5.2.1.1 Factors and Data Types

The purposes of the route step data collection were two-fold:

- to provide an inventory of information as a guide for route identification to minimize potential effects on the environment;
- to provide the information necessary to evaluate and compare the route alternatives.

Not all data collected were used for both the route identification and route evaluations. Some data types were inventoried and mapped, but were successfully avoided by all route alternatives and were, therefore, not considered further as part of the evaluation. Other information became increasingly important once routes were identified for evaluation and comparison purposes. In addition, there were data that could only be collected after the routes had been identified. The viewsheds of the proposed lines and the number of homes within the viewsheds were mapped after routes were located and used to evaluate and compare the alternatives.

The data types inventoried for each factor are identified below followed by a short discussion of how the data were utilized.

(i) Agricultural Resources: Five data types were inventoried for this factor. Agricultural land use patterns were mapped on a field by field basis and were evaluated based on the following data:

- Area of tower base in grain or forage crops (ha);
- Land in market gardening (km);
- Land in tile drainage (km); and
- Area of tower base in pasture land (ha);
- Length of agricultural land crossed (km).

During route identification, an effort was made to avoid lands in grain or forage crops and market gardens, while pasture land was considered to be a preferred location for transmission lines. Areas of tile drainage were identified to confirm the location of intensively farmed land but were not given extra consideration because effects on tile drainage can be mitigated. The length of agricultural land crossed was calculated as part of the consideration of possible effects and mitigation.

(ii) Appearance of the Landscape: Seven data types were inventoried for this factor, of which three data types were sub-divided to consider several aspects under one category. The viewsheds of the scenic roads were originally mapped for the corridor step and were remapped for the route step. The remaining data were collected for the route step. The evaluation of potential visual effects was based on:

- Landscape types crossed (km)
  - natural
  - river valley
  - farming
  - abandoned farming
  - urban;
- Number of crests affected
  - minor
  - major
  - dominant;
- Number of long views

- Length within viewshed of scenic road (km)

- Number of road crossings

  - right angle
  - diagonal;

- Number of homes within line viewshed; and

- Viewshed of proposed transmission lines (ha).

The major and dominant crests and the viewsheds of scenic roads were used during route identification, whereas the remainder of the visual data types were utilized for just the route evaluations. Potential effects on long views were minimized by avoiding major and dominant crests.

The type of landscape crossed was used only for evaluation mainly because most landscapes are continuous across the corridors and could not be directly avoided. Most roads cross the corridors and so could not be avoided. The viewshed of the proposed lines could only be identified after the route alternatives had been mapped.

(iii) Biological Resources: Five data types were inventoried for this factor. The biological data collected for the route identification and evaluation consisted of corridor step information and an inventory of potential habitat. Potential habitat was defined using a model, developed by Ontario Hydro, based on the Ontario Forest Resources Inventory (FRI) (1:10,000). This model integrated woodlot size, cover type, cover diversity, and maturity to predict habitat potential. The biological evaluation considered both the aquatic and terrestrial environments and was based on the following:

- Sensitive/significant biological areas (ha);

- Primary upland wildlife/waterfowl habitat (ha);

- Secondary upland wildlife habitat (ha);

- Wetlands with no known biological information (ha); and

- Number of vegetated stream/river crossings.

All the biological data types, except for the vegetated streams/rivers and smaller wetlands, were used to identify and evaluate alternative routes. Most streams/rivers crossed the corridors and could not be avoided while the smaller wetlands could be spanned by careful placement of the towers.

(iv) Forest Resources: This factor had five data types inventoried for the route step. The forest resources were described through a model which considered management inputs, maturity of natural woodlots and plantations, forest type (that is, upland or lowland hardwoods, pioneer hardwoods or conifers) and the FRI site classes. The forest resources were evaluated based on the following:

- Area of sugar bush and semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha);

- Area of forest management, mature/semi-mature upland hardwoods (FRI site classes 3 and 4) and semi-mature conifer and mature/semi-mature lowland hardwood stands (FRI sites classes 1 and 2) (ha);

- Area of young plantations, young/immature upland hardwoods, mature/semi-mature lowland hardwoods (FRI site classes 3 and 4) and semi-mature conifer stands (FRI sites classes 3 and 4) (ha);

- Area of young pioneer hardwoods, conifers and lowland hardwood stands (ha);

- Area of mature conifers and scattered forest stands (ha).

The first two data types were used extensively during the route identification. The other three data types were used to a lesser extent because continuous forest cover in many corridors made it impossible to avoid the forested areas. All five data types were used to approximate the total amount of forest cover that would be removed along each route.

(v) Heritage Resources: Three data types were inventoried for this factor. The viewsheds of historic settlements were mapped in conjunction with the viewsheds of the proposed lines identified for the Appearance of the Landscape factor. These viewsheds are centred around historic components, such as log or limestone buildings, and define the area from which both the historic features and the proposed lines would be visible. The other Heritage Resources data types consist of re-mapped corridor step data. Heritage Resources was evaluated based on the following:

- Viewsheds of historic communities (ha);

- Number of known archaeological sites; and

- Area of reported but unsubstantiated and high archaeological site potential (ha).

The first and third data types were used for both route identification and evaluation. No known archaeological sites have been identified within any of the corridors and this data type confirmed that the routes avoided these resources.

(vi) Human Settlement: Eight data types were inventoried for this factor, of which five data types were subdivided further. The potential effects on human settlements were evaluated based on:

- Number of permanent residential buildings

    - removals
    - in proximity;

- Number of seasonal residential buildings

  - removals
  - in proximity;

- Number of farm houses and barns

  - removals
  - in proximity;

- Number of farm outbuildings removed;

- Number of commercial facilities removed;

- Number of proposed industrial developments;

- Length of right of way (not owned by Ontario Hydro)

  - diagonal to property fabric (km)
  - parallel to property fabric (km)
  - on or adjacent to property fabric (km); and

- Number of properties affected

  - diagonal to property fabric
  - parallel to property fabric
  - on or adjacent to property fabric.

During route identification an effort was made to avoid all buildings and existing developments. However, several buildings were identified adjacent to existing lines where the route could not avoid them. The last two data types listed were used primarily for evaluation although each route was considered in terms of the implications on these data types during the route identification. In addition, all official plans, zoning by-laws and sub-division plans were reviewed as part of the evaluation and comparison of alternative routes. This review included consideration of existing land uses as well as proposed uses. Examples included proposed industrial parks and areas of future residential development as defined in the official plans and/or Zoning by-laws.

(vii) Mineral Resources: Four data types were inventoried and mapped for this factor. The Mineral Resources Factor is comprised of corridor step data that were updated, checked for accuracy and re-mapped. All information on mineral resources was obtained from government, industry, and municipal contacts. Geologic information was obtained from the literature cited in Appendix B1. The mineral resources were evaluated based on the following:

- Area of existing pits and quarries (ha);

- Area of high aggregate resource potential (ha);

- Area of high industrial mineral potential (ha); and

- Number of sensitive/unique geologic features.

All the Mineral Resources data types were used for both the route identification and evaluation.

(viii) Recreation Resources: Eight data types were inventoried and mapped for this factor. The data types were comprised of corridor step data, which were refined to the route step scale, and an update of the inventory of existing and proposed recreational facilities. The re-mapped corridor step data includes existing recreational sites and the viewsheds of the Rideau Canal, cottaging lakes and canoe routes. Recreational data collected for the route step includes: the viewsheds of campgrounds, parks and foot trails; the location of activities and facilties within parks/conservation areas, such as ski and foot trails; and the location of cottages, although these were mapped on the Human Settlement factor map. The potential effects on recreation were evaluated based on:

- Length within viewshed of Rideau Canal (km);
- Proximity to Rideau Canal Locks (km);
- Length within viewshed of private campgrounds (km);
- Length within the viewsheds of NCC recreation lands, Provincial Parks, Conservation Areas (km);
- Length within viewshed of cottage lakes (km);
- Length within viewshed of canoe routes (km);
- Length within viewsheds of foot trails (km); and
- Number of ski trails crossed.

The first concern was to avoid the features themselves, and then the viewsheds were considered. When canoe routes and foot trails had to be crossed consideration was given as to where these features should be crossed.

(ix) Engineering/Cost: All identified significant physical or cost constraints to the building of transmission lines (such as large lakes) that were considered at the corridor step are successfully avoided. Therefore, the engineering and cost concerns for the route step were addressed in greater detail as separate categories.

5.2.2 Socio-Economic

To provide a broader perspective on the socio-economic environment and to augment information obtained from the MPCs, certain data were collected on a township basis. To better define each township's orientation to development, discussions were held with Ottawa-based planners from the Community Planning Advisory Branch of the Ministry of Municipal Affairs and Housing. These discussions related to the type and amount of development (mainly residential), new development proposals, and current planning problems. The 1981 financial statements of each township were reviewed to determine the percent of the taxable assessment which was commercial, industrial and business.

Resource economic data were collected, where possible, on a township basis. This 1981 data included: value of agricultural sales, value of sales of forest products and maple sugar, and total capital value of farms. Per capita assessments by township were also reviewed. These data were used as gross indicators of economic activity.

As a result of the importance of tourism to the regional economy and in order to identify conflicts between tourists and construction workers for accommodation, an analysis was made of the availability of hotel and motel accommodation within the study area.

5.2.3 Technical

Technical information was collected within and in the vicinity of all corridors to aid in the identification of alternative routes. The location of known facilities which could be affected by the operation of 500 kV transmission lines were mapped, and the organizations that had facilities in the area were contacted. The facilities include airports, major gas and oil pipelines, railway lines, AM radio broadcast stations, cable TV and FM radio head-ends, and other communication facilities.

The Department of Communications provided a list of radio stations and communications facilities which they felt could be affected by the location of a transmission line route. This information was mapped and used in the identification of alternative routes. Analyses were undertaken to determine the nature of the impact of the transmission lines in areas of possible interference.

5.2.3.1 Licensed Airports

No licensed airports are located within the corridors. Ottawa International and Smiths Falls Airports are near the corridors. The Federal Department of Transport was contacted and it was determined that there would be no conflict with height restriction regulations around these airports.

5.2.3.2 Existing Linear Facilities

Existing linear facilities such as pipelines, railways and highways within the alternative corridors did not provide suitable opportunities for paralleling with 500 kV transmission lines because of alignment and conflict with built up areas. Some existing Ontario Hydro rights of way did, however, present suitable routing alternatives and were considered in the location of alternative routes. The existing Ontario Hydro rights of way, for the most part, are on easement rights and would have to be re-acquired if the existing facilities are removed or altered significantly.

5.2.4 Cost Considerations

The cost of constructing a transmission line is affected by a number of factors, including:

- the specific tower design;

- the length of line and the number of angles or turns in the line;

- the clearing of the right of way and the impact of soil conditions on the construction of access roads, tower foundations and tower assembly;
- the cost of special construction practices and mitigation measures;
- the removing of an existing line and the building of a new line, while maintaining adequate service to the customers in the area;
- the cost to acquire the property rights.

All costs referred to in this section are in 1984 present-worth dollars. The approximate cost of constructing a kilometre of new single circuit 500 kV transmission line is about $504,000 per kilometre excluding property. A kilometre of dual voltage (1-cct 500 kV and 1-cct 230 kV) transmission line, which would involve the rebuilding of an existing line, is estimated at about $680,000 per kilometer. These estimates assume stable soil conditions and a typical mix of suspension and angle towers. In identifying alternate routes, it was therefore important to recognize the significant effect that additional line length and line configuration could have on total cost.

The cost varies with the type of tower used. For instance, at angles or turns in the line, heavier and more costly angle towers are required. Where open field conditions exist, the policy of constructing narrow base lattice towers would apply.

As soil conditions become wetter and less stable, the cost of line construction increases.

In forested areas, the cost of clearing the right of way and access road is included. General property cost estimates based on the market value of the types of property affected, the number of towers, and the injurious affection to the remaining lands were assembled for inclusion in the study. The cost of providing suitable construction access to the tower sites was another element that is included in the total cost estimates.

5.3 Identification of Alternative Routes

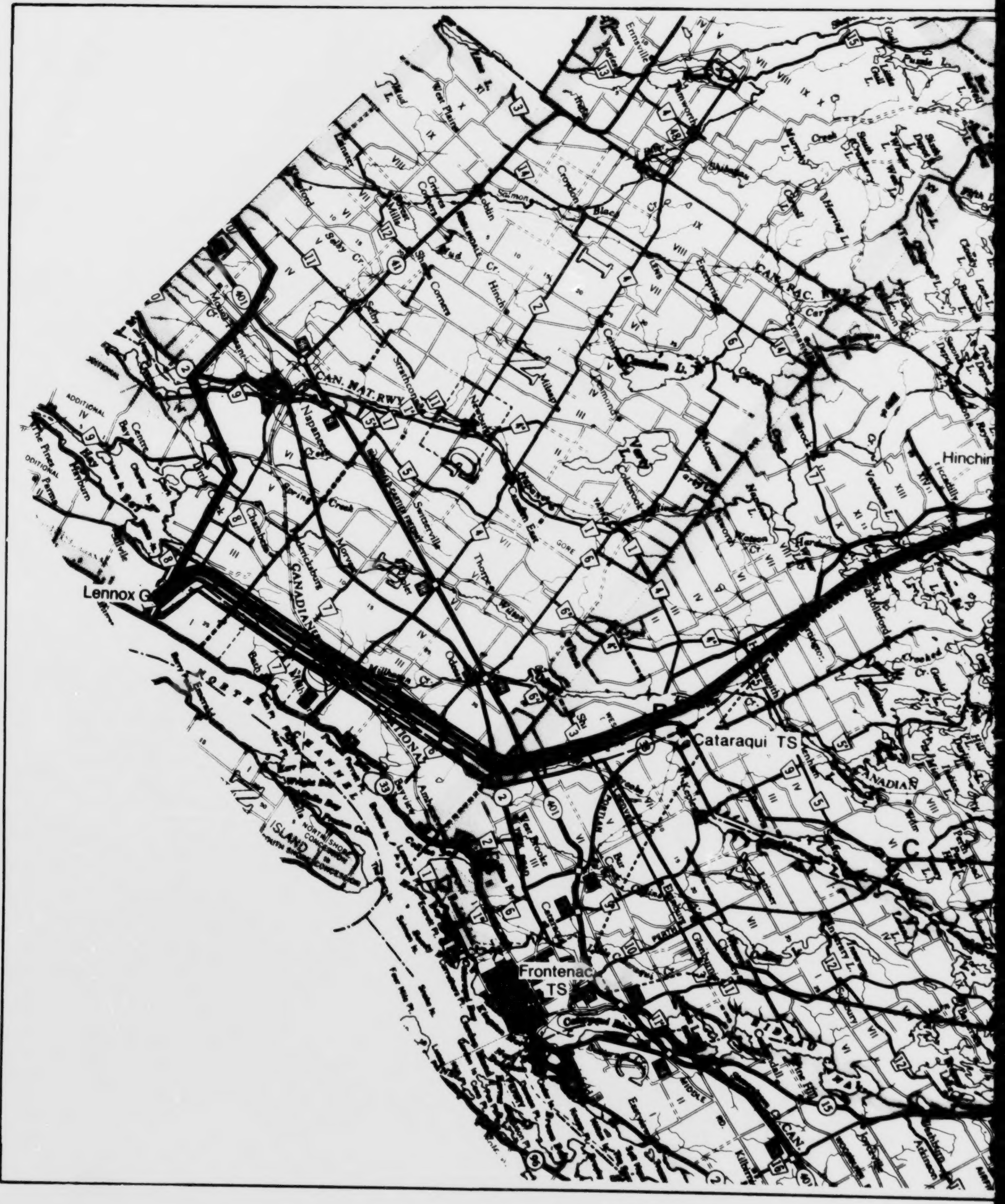
The route alternatives are illustrated in Figure 5.1

As an aid to route location, a set of guidelines were used which are similar to the corridor identification guidelines. These guidelines are general since the identification of a route often required trade-offs and compromises between environmental, cost and technical considerations.

Routes were identified by Ontario Hydro on 1:15,000 scale airphoto mosaic base maps which showed the land use and environmental information. In addition, topographic maps, property assessment maps, and public information supplied in letters and comment forms were used to identify alternative routes.

Some route segments were identified to follow existing rights of way. Alternatives were considered on either side of the existing line. A preference for one side was decided after review of environmental and engineering information. In new corridor areas, routes are aligned in accordance with the guidelines and public comments.

One route was identified within each corridor, except between point F and G, in Bedford Township, and between point Q and R, in the Stittsville area.


Lennox G
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Frontenac TS
Hinchin
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CAN. PAC. RY.
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NORTH CHANNEL
ISLAND
ADDITIONAL
Napanee
Strathcona
Bath
Sydenham
Harrowsmith
Verona
Millhaven Cr.
Salmon
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Croydon
Ernestown
Odessa
Camden East
Enterprise
Yarker
Collins
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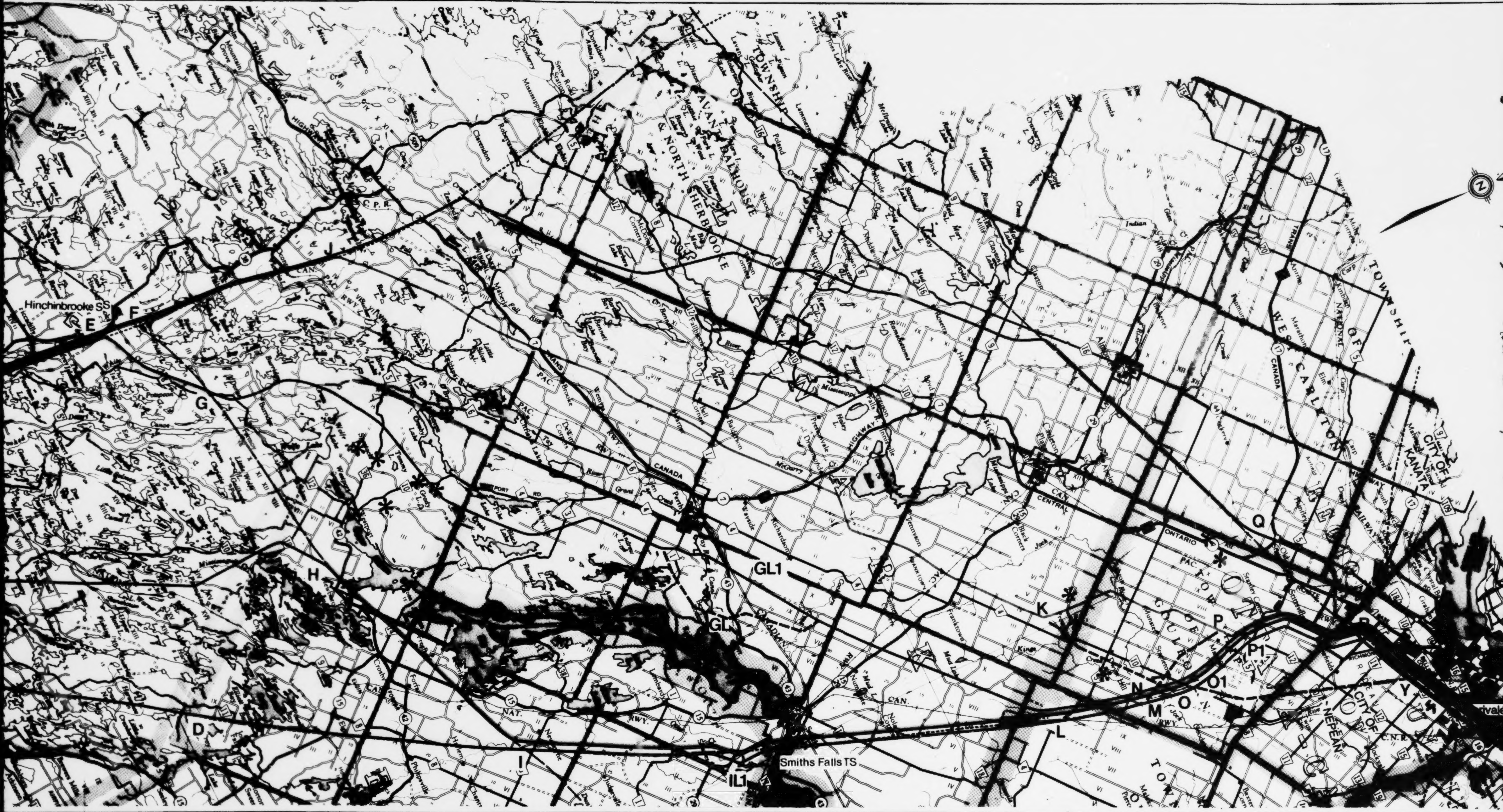
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LAVANT, DALHOUSIE & NORTH SHERBROOKE
TOWNSHIP OF
WEST CARLETON
TOWNSHIP OF
CITY OF KANATA
CITY OF NEPEAN
CANADA PACIFIC
CANADIAN NATIONAL RWY.
Perth
Carleton Place
Mississippi
Tay River
Rideau
Almonte

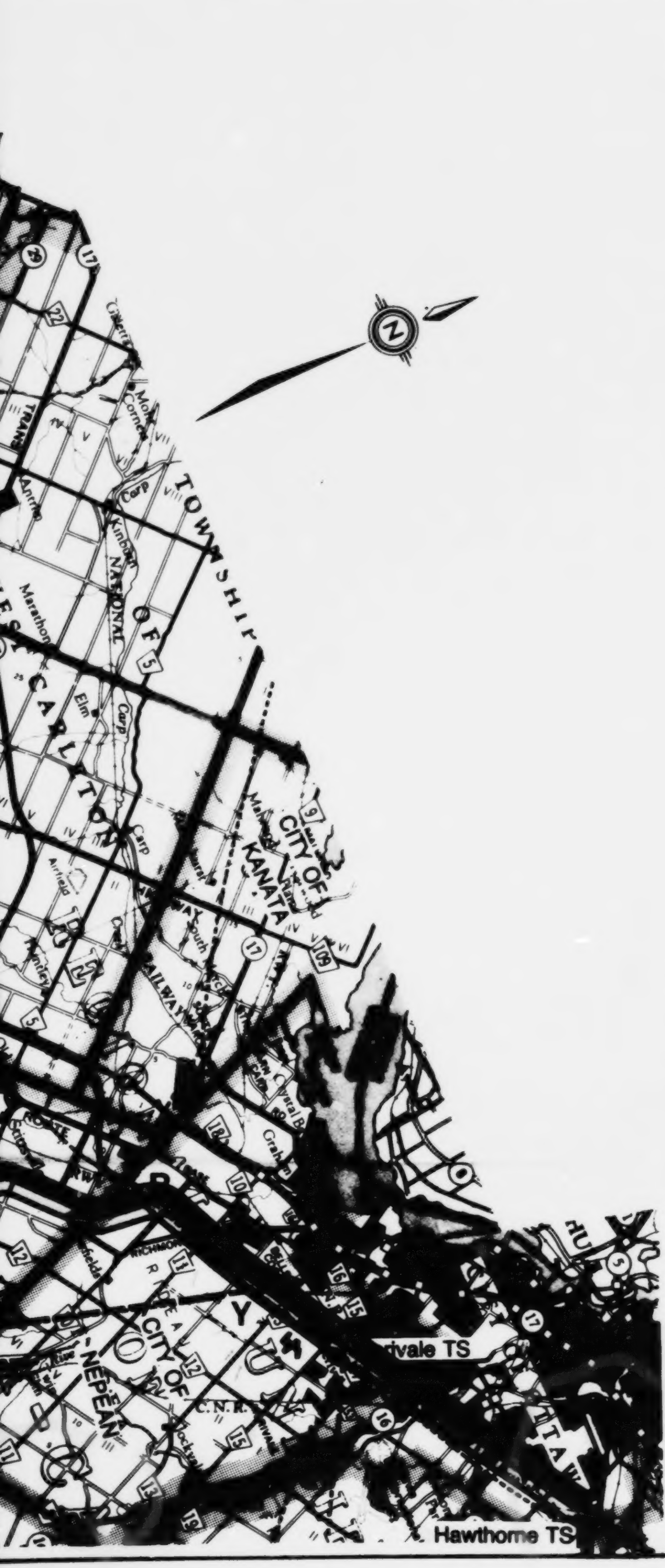

TOWNSHIP OF
CARLETON
CITY OF KANATA
CITY OF NEPEAN
Carp
Kinburn
Marathon
Antrim
Merivale TS
Hawthorne TS
17
5
16
15

Figure 5.1
Recommended Route and Sites

Legend

▬ Existing 500 kV Line

— — Existing 230 kV Line

------------ Existing 115 kV Line

■ Transformer or Switching Station

- - - - Sub-Links

A Route Intersection

Recommended Telecommunication Sites

✱ Alternative Telecommunication Sites

Recommended Route

▬ Alternative Routes

Alternative routes and sites
are not drawn to scale

Scale 1 250,000

5 0 5 Miles

5 0 5 Kilometres

Eastern Ontario Study – West Section

Section FG, in Bedford Township, is not included because it would be more costly than EG and would affect homes and cottages at White Lake. Expansion of the existing right of way FG would have necessitated overhanging Bobs Lake.

Section QR, in West Carleton and Goulbourn townships, follows an existing transmission line which crosses Highway 7 at the north end of Stittsville, and passes through the new community of Amberwood. Expansion of this right of way would directly affect two subdivisions, a commercial development at Highway 7, and proposed housing and industrial developments in Goulbourn Township.

In both cases, alternate routes identified by-pass these high constraint areas.

5.4 Description of Alternative Routes

The various route links when used in combination, resulted in the development of seven route alternatives between the vicinity of Cataraqui TS and Merivale TS. The route alternatives are illustrated in Figure 5.1. All intersection points are lettered and the links are described by specifying the letters at each intersection (such as AB).

The section from Lennox GS to point A and from point Y to Hawthorne TS are common to all alternative routes considered. The seven possible route alternatives between points A and Y were identified and assigned colour designations for easy reference (refer to Figure 5.1). A detailed description of these routes and the rationale for their location is provided in Appendix F.

5.4.1 Common Route Sections

5.4.1.1 Lennox GS to Point A

An existing right of way from Lennox GS to point A about 4.5 km south of Cataraqui TS, would be used to locate the new 500 kV transmission lines. Through this area, the new lines would be built on Ontario Hydro owned property between two existing 230 kV transmission lines.

5.4.1.2 Point Y to Merivale TS

In the Ottawa area, all alternative routes converge on point Y, east of Cedarview Road in the City of Nepean. On this right of way, there are two transmission lines which lead east into Merivale TS.

Between Woodroffe Avenue and Merivale TS, there is residential development adjacent to both sides of the right of way which would restrict the expansion of the right of way. The new lines would be consolidated with the existing lines through this area and no additional right of way would be required.

5.4.1.3 Merivale TS to Hawthorne TS

In the cities of Nepean and Ottawa, the new lines would be consolidated with existing transmission lines. Except for one short section near the Rideau River crossing, the existing 90 to 150 m wide right of way can accommodate all existing lines and the two new 500/230 kV lines. On the west bank of the Rideau River there is sufficient right of way for the first line. The right of way would have to be widened to accommodate the second line.

This existing right of way abuts residential development between the Rideau River crossing and a point east of Bank Street in Ottawa. The balance of the right of way is located in areas of either existing or proposed industrial/commercial development.

5.5 Public Review of Alternative Routes

At this step in the study, property owners within all of the alternative corridors as well as property owners potentially affected by routes located outside a corridor were identified. The properties were located on Ministry of Revenue assessment maps (1982) and using the roll numbers listed on these maps, names and addresses were obtained and incorporated into the project mailing list.

In the Township of Lavant, Dalhousie and North Sherbrooke, where no assessement maps were available, the roll numbers were obtained directly from the municipalities.

The mailing list was verified by visiting local assessment offices and municipalities. The roll numbers for all properties either within an alternative corridor or at least within 120 meters of a route were obtained where that route was at the edge of or outside a corridor. Whenever possible, names and addresses of tenants were also added to the mailing list. Approximately 6,000 names were collected in this manner.

On October 26, 1983, Bulletin No. 3 and a map showing alternative transmission routes was sent to all people on the mailing list. It included a list of all the scheduled MPCs. Advertisements containing similar information were placed in area newspapers.

On October 29, 1983, the Advisory Group met to review and comment on the alternative routes. However, most group members wished to review the routes with their organizations before submitting their comments.

A second series of 24 MPCs was held in November, 1983 to allow local residents to review the alternative routes and to provide detailed locational information and comments. Approximately 1,600 people attended these MPCs. Formal question and answer sessions were held at the request of local residents after several of the MPCs.

About 300 comment forms were completed by the public. The comments most frequently stated were related to:

- property acquisition and compensation
- project need
- use of herbicides
- Ontario Hydro's marketing campaign
- loss of farm land
- aesthetic effects
- alternatives to the project
- consolidation options

Locational concerns were expressed as both site specific concerns which were noted on maps and/or comment forms, and by way of general routing suggestions that the public expressed.

Several suggestions were made at the MPCs concerning minor modifications to the proposed routes. These suggestions were reviewed and in most cases the routes were revised accordingly (refer to Appendix F).

It was also suggested that Ontario Hydro consider a route through the wetland northwest of Richmond (Sub-link O_1P_1). Subsequent study indicated that this route seemed feasible but more detailed information was required. A public meeting was held on January 19, 1984 to obtain information and to notify Goulbourn Township and potentially affected property owners. At the meeting the project was discussed with property owners, municipal officials and OFA representatives, and additional information about the area was received. It was then decided to include this link as an alternative for detailed evaluation.

Line Numbers

6.0 EVALUATION AND COMPARISON OF ALTERNATIVE ROUTES

6.1 General

The next step in the planning process involved the evaluation and comparison of the alternative routes between points A and Y. First, the evaluation process provided land use, environmental, cost, technical and socio-economic information and public assessments on the various alternatives for use in the route comparisons.

Second, during the comparison process the similarities and differences with respect to the land use, environmental, cost, technical and socio-economic considerations of the alternative routes were analyzed. Based on the comparison, the relative advantages and disadvantages among the routes were determined. Due to the number of links involved and the implications of parallelling and consolidating with existing transmission lines a four level comparison was used to eliminate alternatives (refer to Figure 6.1).

- Level I. The links which parallelled existing rights of way were examined to determine where the new lines could be either consolidated or parallelled with the existing lines. It was decided, in most cases, that the first line should be parallel to and the second line should be consolidated with the existing facilities.

- Level II. Sub-links in the areas south of Perth and south of Smiths Falls were evaluated and compared, and preferred sub-links were selected.

- Level III. The links were combined to form sub-routes in the north and south of the study area for evaluation, comparison and elimination of links.

- Level IV. The remaining links were combined to form alternative routes between point A and Y for evaluation, comparison and selection of a recommended route.

As a general guideline, it was decided that the two 500 kV lines should not follow separate rights of way where significant lengths of new right of way would be involved for the following reasons:

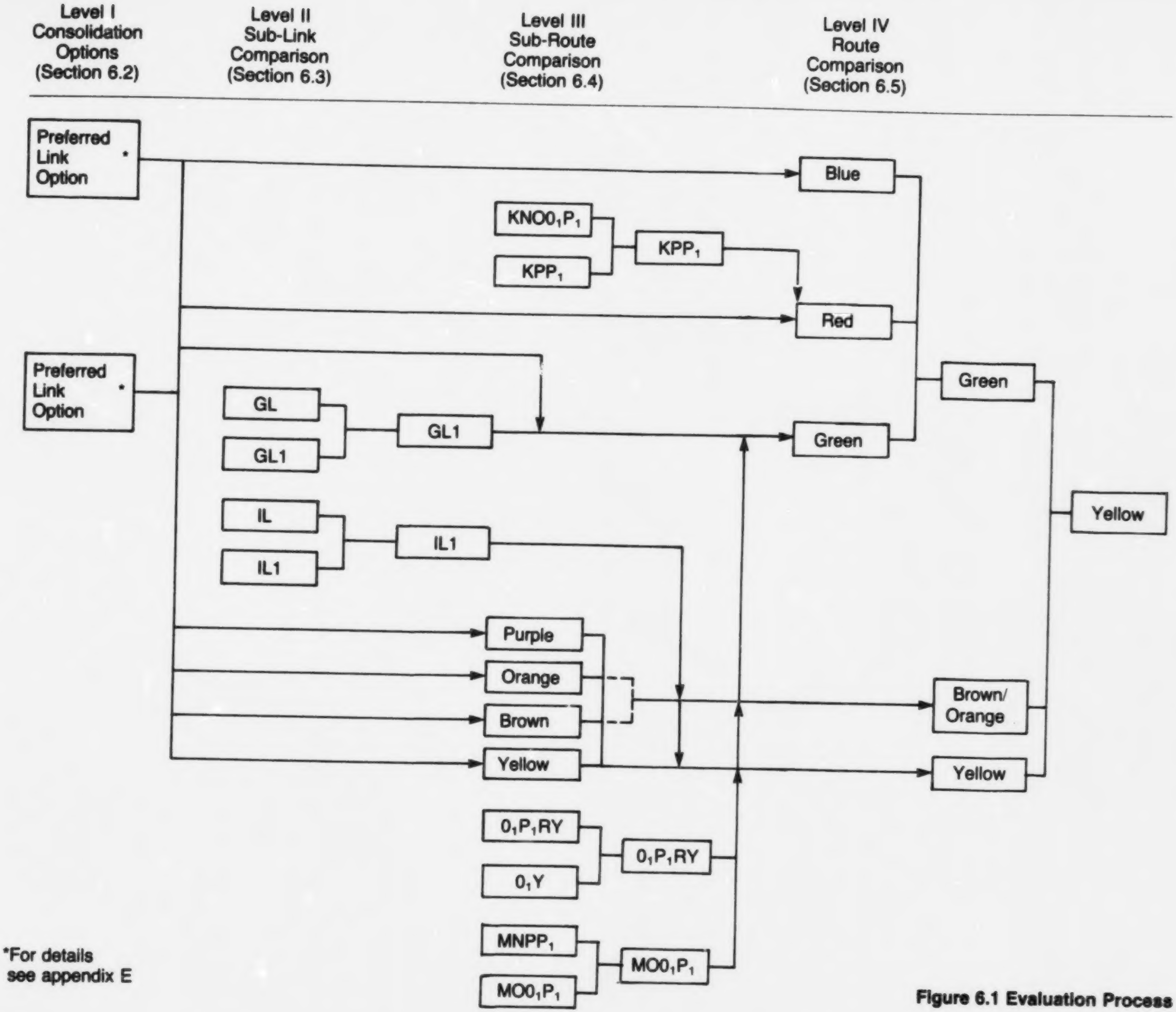
- most land use and environmental features would be less affected by confining the disturbance to one area;

- less people would be affected by a single right of way;

- less total right of way would be required; and

- one right of way would reduce the costs.

In areas where parallelling or consolidating the new transmission facilities with the existing transmission lines are technically and environmentally desirable, the right of way requirements were determined and the associated potential effects were evaluated. In areas where new routes were proposed, they were assessed to evaluate the potential effects of a 100 metre wide right of way required to accommodate 2 - 1 cct, 500 kV lines.


Level I
Consolidation
Options
(Section 6.2)
Level II
Sub-Link
Comparison
(Section 6.3)
Level III
Sub-Route
Comparison
(Section 6.4)
Level IV
Route
Comparison
(Section 6.5)
Preferred Link Option *
Preferred Link Option *
GL
GL1
GL1
IL
IL1
IL1
$KNO0_1P_1$
KPP_1
KPP_1
Purple
Orange
Brown
Yellow
0_1P_1RY
0_1Y
0_1P_1RY
$MNPP_1$
$MO0_1P_1$
$MO0_1P_1$
Blue
Red
Green
Brown/
Orange
Yellow
Green
Yellow

*For details see appendix E

Figure 6.1 Evaluation Process

Line
Numbers

6.1.1 Land Use and Environment

The land use and environmental evaluation was comprised of two distinct components. First, the magnitude of the potential effects resulting from each route link was measured. The numerical measurements were then aggregated, by respective data type, for each link in the route alternative and tabulated. Second, the significance of the potential effects was described in order to put the predicted environmental changes in perspective. This approach allowed for the consideration of information that could be measured and expressed numerically as well as for information that was not quantifiable or was more effectively expressed in qualitative terms.

The comparison of the advantages and disadvantages among the route alternatives was based upon consideration of both the quantitative and qualitative components. The quantitative analysis served to highlight the range of relative differences among the potential effects for each route alternative. The qualitative analysis described the key issues or environmental problems, and outlined other information, such as mitigation measures, that could minimize potential effects.

6.1.2 Socio-Economic

Four criteria were developed to evaluate and compare the socio-economic effects of transmission lines in eastern Ontario. These criteria were based upon the results of a literature review of socio-economic effects of transmission lines, knowledge of the study area, and judgment of recurring concerns expressed at the MPCs. The criteria are as follows:

- ability to handle change;
- compatibility with the community;
- economic change;
- social/lifestyle change.

Additional information on the criteria is contained in Appendix B.6.

An assessment of the socio-economic effects was provided on a comparative basis with the relative merits of the route alternatives highlighted. Quantitative support data are presented in Appendix B.6.

6.1.3 Cost/Technical

An estimate for each route was calculated to include property acquisition and construction costs. For evaluation purposes, the in-service dates considered were: 1989 for the 1st line and 2000 for the second line. The costs are expressed in present worth dollars (1984) to reflect the different in-service dates of the two lines and to evaluate the future monies spent on a common economic basis. Although it is possible that the second line could be placed in-service as early as 1990, it was assumed to be installed at the end of the study period so that the present worth cost differences between alternative routes would be minimized. Any advancement of the second line would increase the cost difference of the alternatives to the advantage of the least costly alternatives. All potential property costs were included for the first line for all alternative routes to reflect current acquisition practices. The timing of consolidation was deferred as long as possible to reduce costs. The potential additional costs which could be incurred from property acquisition and the installation of narrow base towers on agricultural land were evaluated for each route.

For technical reasons, it is preferred to minimize the lengths of transmission lines to minimize losses and reduce the likelihood of outages. All alternative routes examined are acceptable in terms of meeting the design criteria and in fact there is little technical difference among the alternative routes.

6.1.4 Public Involvement

Each route was evaluated and compared based on the degree to which it satisfied the most often stated public guidelines as expressed in comment forms, letters and meetings. The main points expressed are summarized as follows:

- follow existing Ontario Hydro rights of way where possible;
- consider consolidation with or upgrading of existing lines where possible;
- minimize the effects on homes, buildings, and developed areas;
- minimize the effects on agricultural and natural areas.

6.2 Existing Transmission Line Facilities (Level I)

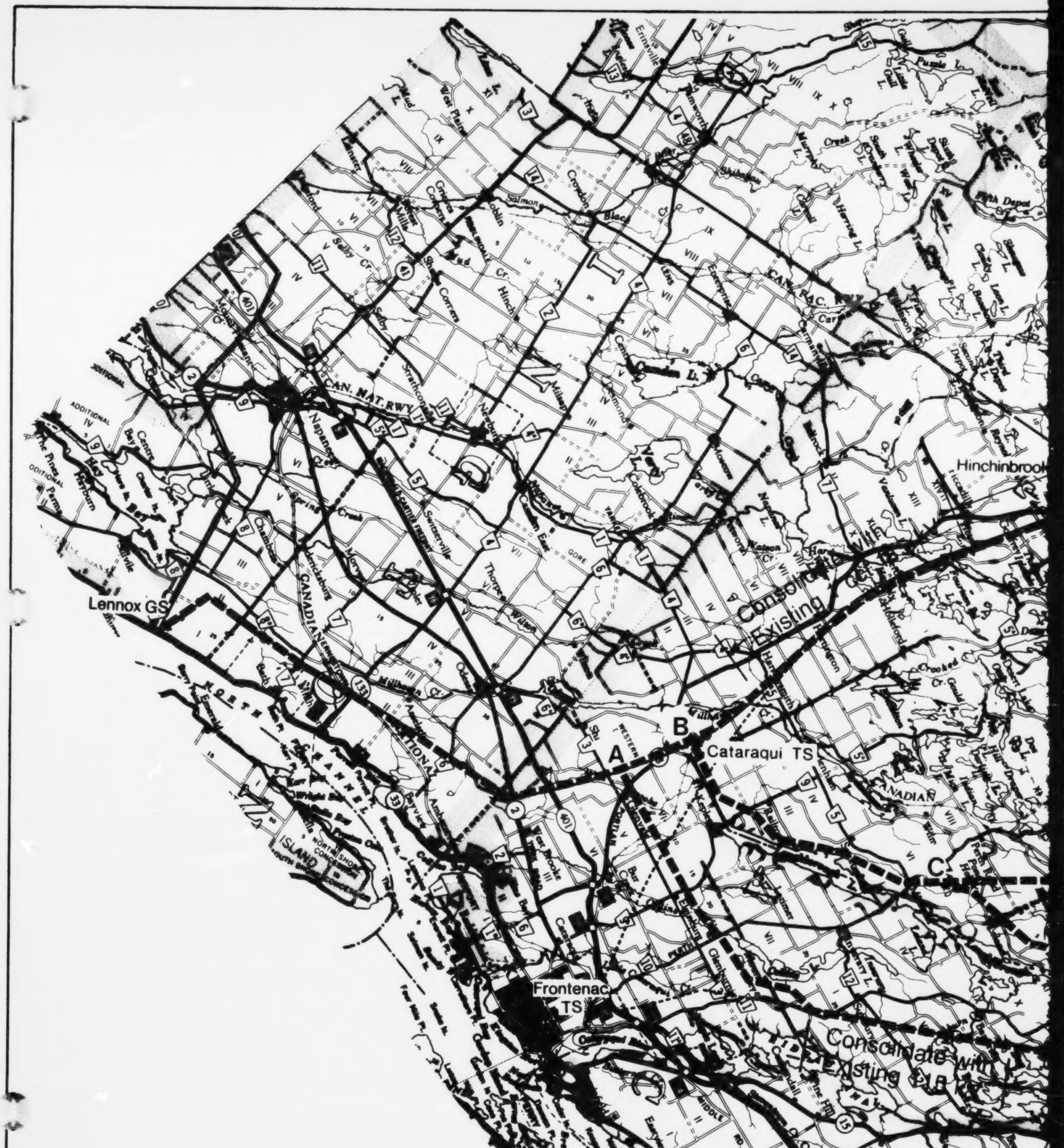
Existing rights of way were studied to determine the feasibility of:

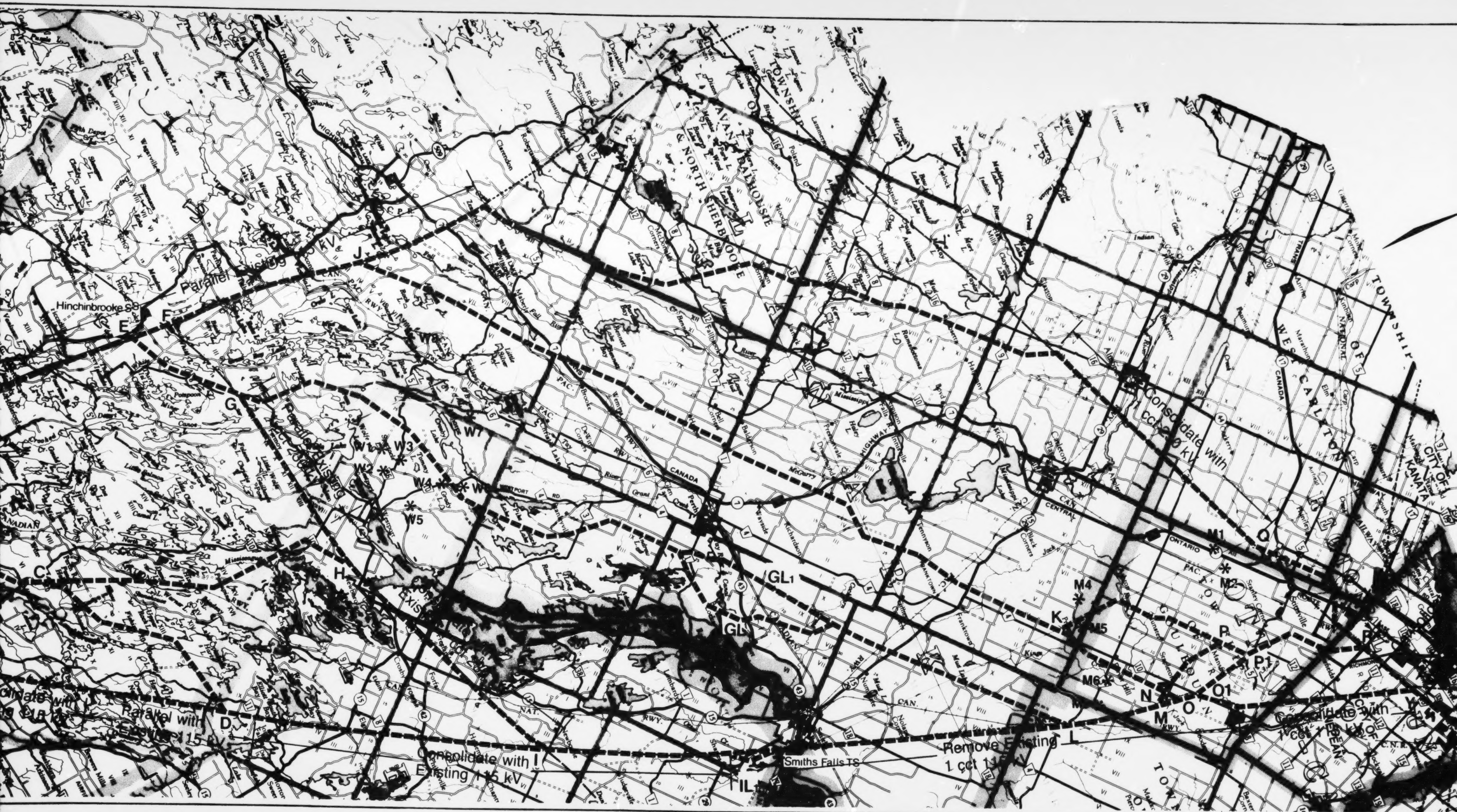
- decommissioning and removing the existing lines;
- removing existing lines from service for construction of the new consolidated line;
- parallelling the existing line while minimizing effects on the surrounding environment;
- removing the existing towers and constructing a new consolidated tower to accommodate both the existing lines and the new 500 kV lines.

When parallelling or consolidating with existing facilities, the existing easement rights would have to be re-negotiated. Consolidation of the lines could reduce the number of residences that would have to be removed and the number of towers in open farm field locations, but would increase the costs. The options selected for consolidation are outlined in Appendix E (refer to Figure 6.2).

6.3 Sub-Link Evaluation and Comparison (Level II)

The two sub-links, south of Perth (GL vs GL1) and south of Smiths Falls (IL vs IL1) were evaluated and compared to select the preferred sub-link in each area.


Lennox GS
Hinchinbrook
Consolidate with Existing
A
B
Cataraqui TS
C
Frontenac TS
Consolidate with Existing



Hinchinbrooke SS
E
F
Parallel Existing kV
J
G
C
H
D
W1
W2
W3
W4
W5
W7
Parallel with Existing 115 kV
Consolidate with
Consolidate with Existing 115 kV
I
IL
Smiths Falls TS
Remove Existing 1 cct 115 kV
L
GL
GL1
K
M1
M2
M4
M5
M6
M
N
O
O1
P
P1
Q
Consolidate with
Consolidate with 1 cct 115 kV
LAVANT DALHOUSIE & NORTH SHERBROOKE TOWNSHIP
WEST CARLETON TOWNSHIP
CITY OF KANATA
NEPEAN
Smiths Falls
Perth
Carleton Place

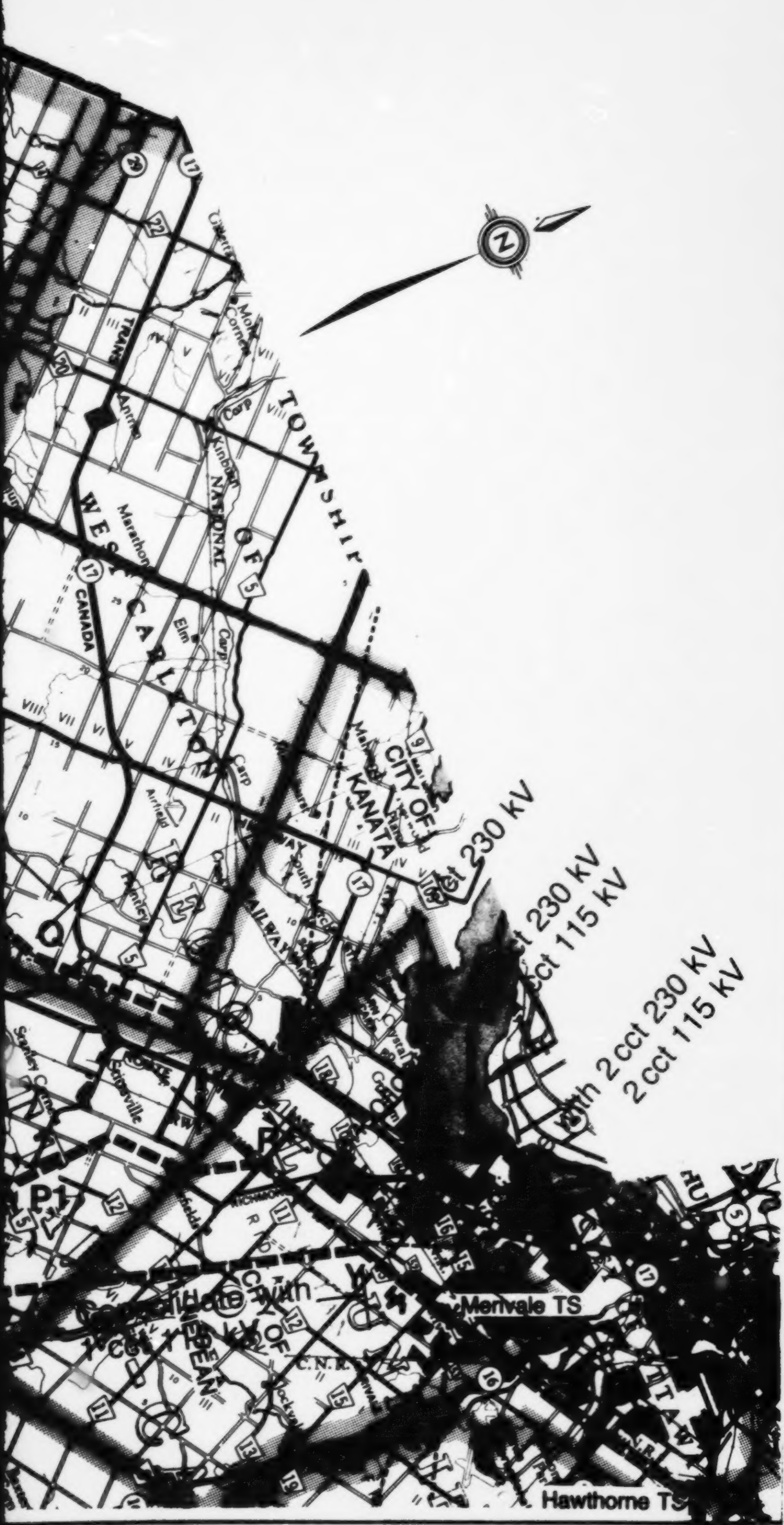

N
TOWNSHIP OF WEST CARLETON
CITY OF KANATA
cct 230 kV
cct 230 kV
cct 115 kV
with 2 cct 230 kV
2 cct 115 kV
Consolidate with
1 cct 115 kV
CITY OF NEPEAN
P1
Merivale TS
Hawthorne TS

Figure 6.2
Consolidation Option Considered

Legend

━━━	Existing 500 kV line
——	Existing 230 kV Lines
-----------	Existing 115 kV Line
■	Transformer or Switching Station
▲	Generating Station
▬ ▬ ▬	Alternative Routes
A	Route Intersection
*	Alternative Telecommunication Sites

Note: Route & site alternatives may be changed as a result of further input from the public

Alternative routes and sites are not drawn to scale

Scale 1 250,000

5 0 5 Miles

5 0 5 Kilometres

Eastern Ontario Study
West Section

Line Numbers

6.3.1 GL vs GL1 (Figure 6.3 and Table 6.1)

Sub-link GL1 was preferred because of the following advantages:

- would have a better crossing of the Tay River (crossed at right angles where more vegetative screening exists);

- would avoid the Tay Marsh and Jebbs Creek wetland;

- would be outside the viewsheds of Otty and Lower Rideau lakes and Beveridge Locks;

- would affect less primary upland wildlife/waterfowl habitat;

- would require less forest clearing and would avoid two maple sugar bushes (3 ha);
- would require fewer angle towers and less diagonal right of way on tiled agricultural land and other properties;

- would have less effect on the viewsheds of the Lanark County Byways;

- would be approximately $1.6 million less expensive.

The advantages of GL1 outweighed the following disadvantages:

- would require the removal of two farm outbuildings;

- would be visible to a greater number of homes;

- would cross the Rideau Valley Conservation Authority lands near their interpretive facilities.

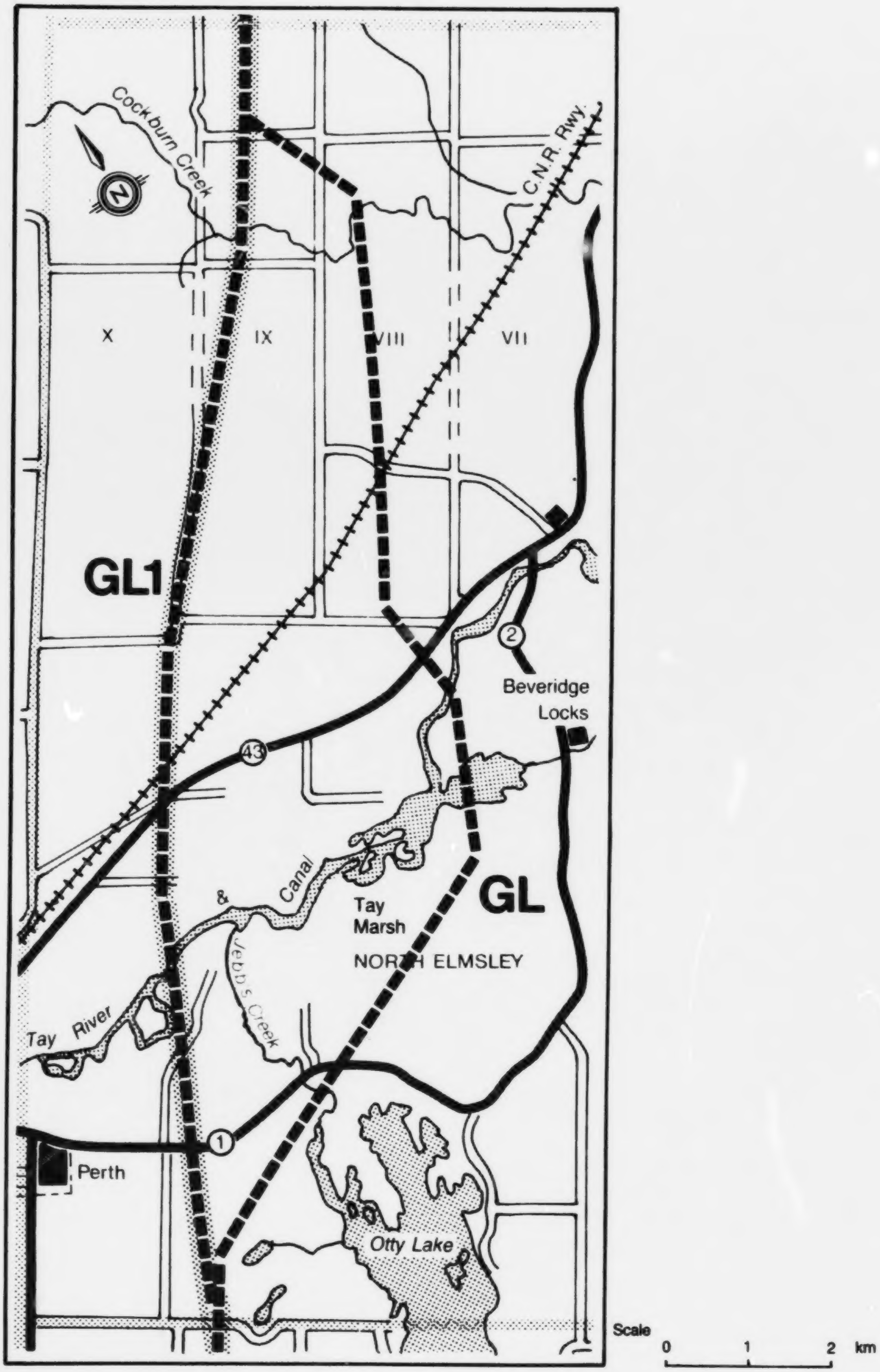

Cockburn Creek
N
C.N.R. Rwy.
X
IX
VIII
VII
GL1
2
Beveridge
Locks
43
GL
&
Canal
Tay
Marsh
NORTH ELMSLEY
Jebb's Creek
Tay River
1
Perth
Otty Lake
Scale
0
1
2
km

Figure 6.3
GL vs GL1

Table 6.1 Sub-Link Evaluation GL vs GL_1 – Land Use and Environment

		G-L	GL1
		2-LINES	2-LINES
LENGTH (km)	Sub-Link Length	16.3	14.6
FACTOR	Data Types		
AGRICULTURAL RESOURCES	Area of tower base in grain & forage crops (ha)	1.4	1.4
	Land in market gardening (km)	-	-
	Land in tile drainage (km)	0.8	0.5
	Area of tower base in pasture land (ha)	0.2	0.6
	Length of agricultural land crossed (km)	4.4	5.8
APPEARANCE OF THE LANDSCAPE	Landscape types crossed (km)		
	- natural	6.9	6.8
	- river valley	-	-
	- farming	8.5	7.4
	- abandoned farming	0.9	0.4
	- urban	-	-
	Number of crests affected		
	- minor	3	4
	- major	2	-
	- dominant	-	-
	Number of long views	-	-
	Length within viewshed of scenic roads (km)	6.4	1.9
	Number of road crossings		
	- right angle	1	7
	- diagonal	6	1
	Number of homes within line viewshed	99	119
	Viewshed of proposed transmission line(s) (ha)	2495	3762
BIOLOGICAL RESOURCES	Sensitive/significant biological areas (ha)	7.0	-
	Primary upland wildlife/waterfowl habitat (ha)	83.0	50.0
	Secondary upland wildlife habitat (ha)	1.0	8.0
	Wetlands with no known biological information (ha)	47.0	9.0
	Number of vegetated stream/river crossings	2	1
FOREST RESOURCES	Area of sugar bush and semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha)	3.7	4.5
	Area of forest management, mature/semi-mature upland hardwoods (FRI site classes 3 and 4) and semi-mature conifer and mature/semi-mature lowland hardwood stands (FRI site classes 1 and 2) (ha)	27.8	23.6
	Area of young plantations, mature/semi-mature lowland hardwoods (FRI site classes 3 and 4 and semi-mature conifer stands (FRI site classes 3 and 4) (ha)	14.9	3.7
	Area of young pioneer hardwoods, conifers and lowland hardwood stands (ha)	24.6	27.9
	Area of mature conifers and scattered forest stands (ha)	7.5	3.5
HERITAGE RESOURCES	Viewsheds of historic communities (ha)	2495	3762
	Number of known archaeological sites	-	-
	Area of reported but unsubstantiated and high archaeological site potential (ha)	11.0	6.0
HUMAN SETTLEMENT	Number of permanent residential buildings		
	- removals	-	-
	- in proximity	1	2
	Number of seasonal residential buildings		
	- removals	-	-
	- in proximity	-	-
	Number of farm houses and barns		
	- removals	-	-
	- in proximity	-	1
	Number of farm outbuildings removed	-	2
	Number of commercial facilities removed	-	-
	Number of proposed industrial developments	-	-
	Length of right of way (not owned by O.H.)		
	- diagonal to property fabric (km)	9.8	6.0
	- parallel to property fabric (km)	5.0	1.9
	- on or adjacent to property fabric (km)	1.5	6.7
	Number of properties affected		
	- diagonal to property fabric	23	13
	- parallel to property fabric	10	4
	- on or adjacent to property fabric	8	20
MINERAL RESOURCES	Area of existing pits and quarries (ha)	4.5	3.3
	Area of high aggregate resource potential (ha)	-	-
	Area of high industrial mineral potential (ha)	-	-
	Number of sensitive/unique geologic features	-	-
RECREATION RESOURCES	Length within viewshed of Rideau Canal (km)	4.2	2.7
	Proximity to Rideau Canal locks (km)	1.0	5.3
	Length within viewshed of private campgrounds (km)	-	-
	Length within viewshed of NCC recreation lands, Provincial Parks, Conservation Areas (km)	4.2	3.8
	Length within viewshed of cottage lakes (km)	3.8	-
	Length within viewshed canoe routes (km)	4.2	2.7
	Length within viewshed of foot trails (km)	5.3	4.7
	Number of ski trails crossed	-	-
COST	$ Million (1984 NPW)	9.7	8.1

Line Numbers

6.3.2 IL vs IL1 (Figure 6.4 and Table 6.2)

Sub-link IL1 was preferred, because it had the following advantages:

- would have less effect on human settlement;
- would have less visual effects on the Otterdale Mobile Home Park and on homes on the south side of Otter Creek;
- would require less diagonal right of way;
- less probability that towers would be located in the flood plain of Otter Creek.

The advantage of IL1 outweighed the following disadvantages:

- would require more heavy angle towers on productive agricultural land;
- would cost about $400,000 more than IL.

6.4 Sub-Route Evaluation and Comparison (Level III)

This section deals with sub-route evaluation and comparisons in the north and south portions of the study area. In the north, the intent was to reduce the number of route alternatives into the Ottawa Area. In the south, the intent was to reduce the number of route alternatives between point A and I.

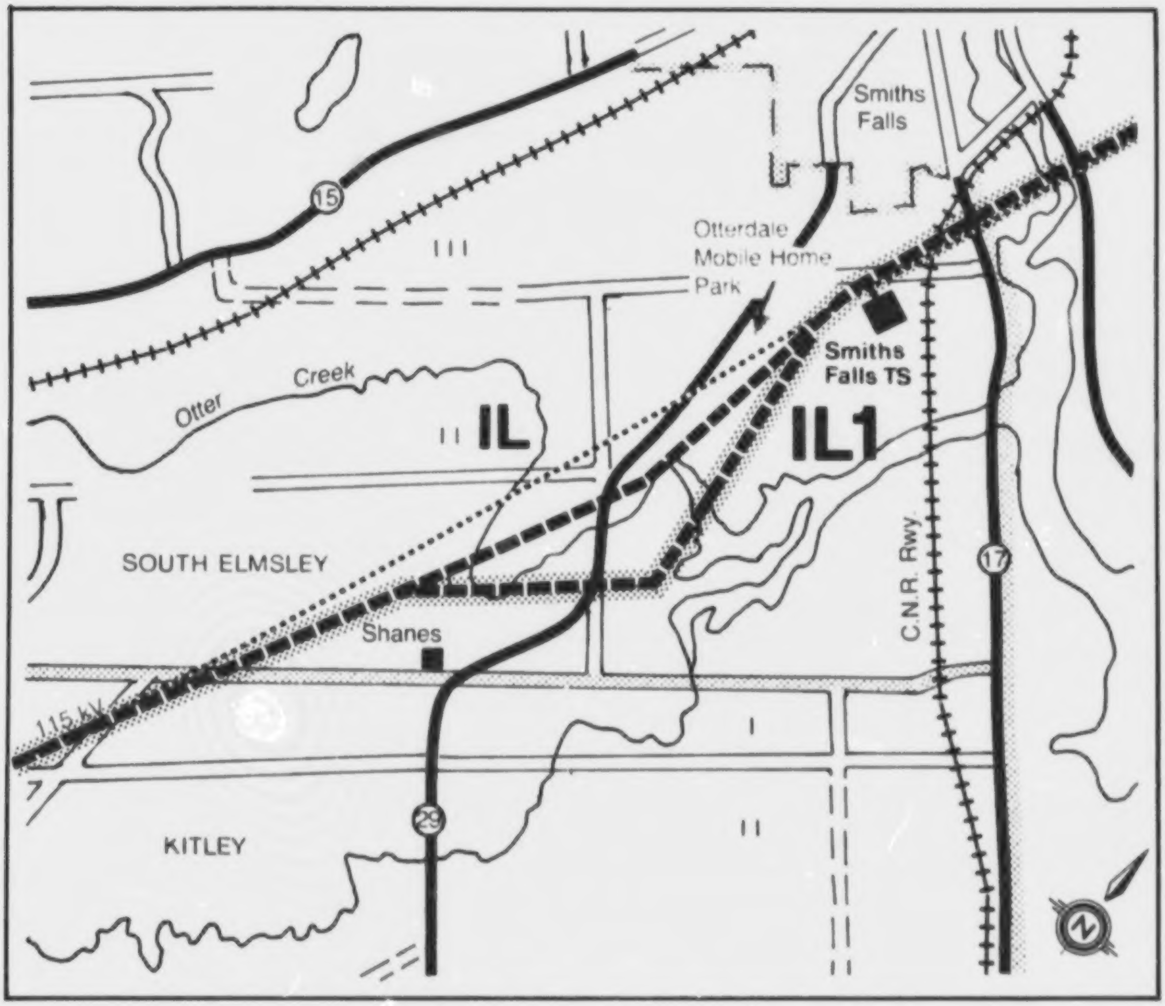

Smiths Falls
15
Otterdale
Mobile Home
Park
Otter
Creek
IL
IL1
Smiths
Falls TS
SOUTH ELMSLEY
Shanes
C.N.R. Rwy.
17
115 kV
KITLEY
29
N

Figure 6.4
IL vs IL1

Scale
0
1
2
km

Table 6.2 Sub-Link Evaluation IL vs IL$_1$ Land Use and Environment

		I-L	I-L$_1$
		2-LINES	2-LINES
LENGTH (km)	Sub-Link Length	3.2	3.5
FACTOR	Data Types		
AGRICULTURAL RESOURCES	Area of tower base in grain & forage crops (ha)	0.4	0.7
	Land in market gardening (km)	-	-
	Land in tile drainage (km)	-	-
	Area of tower base in pasture land (ha)	0.2	0.3
	Length of agricultural land crossed (km)	1.3	2.0
APPEARANCE OF THE LANDSCAPE	Landscape types crossed (km)		
	- natural	-	0.5
	- river valley	-	-
	- farming	0.6	3.0
	- abandoned farming	0.4	-
	- urban	2.2	-
	Number of crests affected		
	- minor	1	-
	- major	-	1
	- dominant	-	-
	Number of long views	-	-
	Length within viewshed of scenic roads (km)	-	-
	Number of road crossings		
	- right angle	-	1
	- diagonal	1	-
	Number of homes within line viewshed	197	197
	Viewshed of proposed transmission line(s) (ha)	9634	9634
BIOLOGICAL RESOURCES	Sensitive/significant biological areas (ha)	-	-
	Primary upland wildlife/waterfowl habitat (ha)	-	-
	Secondary upland wildlife habitat (ha)	-	-
	Wetlands with no known biological information (ha)	-	-
	Number of vegetated stream/river crossings	3	2
FOREST RESOURCES	Area of sugar bush and semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha)	-	-
	Area of forest management, mature/semi-mature upland hardwoods (FRI site classes 3 and 4) and semi-mature conifer and mature/semi-mature lowland hardwood stands (FRI site classes 1 and 2) (ha)	-	-
	Area of young plantations, mature/semi-mature lowland hardwoods (FRI site classes 3 and 4 and semi-mature conifer stands (FRI site classes 3 and 4) (ha)	-	-
	Area of young pioneer hardwoods, conifers and lowland hardwood stands (ha)	1.3	-
	Area of mature conifers and scattered forest stands (ha)	5.8	13.7
HERITAGE RESOURCES	Viewsheds of historic communities (ha)	3270	3270
	Number of known archaeological sites	-	-
	Area of reported but unsubstantiated and high archaeological site potential (ha)	-	-
HUMAN SETTLEMENT	Number of permanent residential buildings		
	- removals	-	-
	- in proximity	4	-
	Number of seasonal residential buildings		
	- removals	-	-
	- in proximity	-	-
	Number of farm houses and barns		
	- removals	-	-
	- in proximity	1	-
	Number of farm outbuildings removed	-	-
	Number of commercial facilities removed	-	-
	Number of proposed industrial developments	-	-
	Length of right of way (not owned by O.H.)		
	- diagonal to property fabric (km)	3.2	1.8
	- parallel to property fabric (km)	-	1.2
	- on or adjacent to property fabric (km)	-	0.5
	Number of properties affected		
	- diagonal to property fabric	12	3
	- parallel to property fabric	-	5
	- on or adjacent to property fabric	-	3
MINERAL RESOURCES	Area of existing pits and quarries (ha)	-	-
	Area of high aggregate resource potential (ha)	-	-
	Area of high industrial mineral potential (ha)	-	-
	Number of sensitive/unique geologic features	-	-
RECREATION RESOURCES	Length within viewshed of Rideau Canal (km)	3.2	3.5
	Proximity to Rideau Canal locks (km)	-	-
	Length within viewshed of private campgrounds (km)	-	-
	Length within viewshed of NCC recreation lands, Provincial Parks, Conservation Areas (km)	-	-
	Length within viewshed of cottage lakes (km)	-	-
	Length within viewshed canoe routes (km)	3.2	3.5
	Length within viewshed of foot trails (km)	3.2	3.5
	Number of ski trails crossed	-	-
COST	$ Million (1984 NPW)	1.8	2.3

6.4.1 North Area Sub-Routes

In the north, the links between points M and Y were evaluated and compared to select the preferred links which then could be added to the Green, Orange, Purple, Yellow and Brown Routes. The links between points K and Y were evaluated and compared to select the preferred links which then could be added to the Red Route.

6.4.1.1 O_1P_1RY vs O_1Y (Figure 6.5 and Table 6.3)

Sub-Route O_1P_1RY was preferred because it had the following advantages:

- would cross less agricultural land diagonal to the property fabric, with fewer towers in mid-field locations and less tile drained land crossed;
- would avoid a diagonal crossing of the Agriculture Canada Experimental Farm;
- would be less visible;
- would avoid the historic and recreationally significant log farm in the Stony Swamp;
- would affect fewer properties;
- would not require the removal of any buildings and would be further away from neighbouring residences and farm buildings.

These advantages outweighed the following disadvantages of O_1P_1RY:

- would have less potential for consolidating lines on agricultural land;
- would affect the CBC Shortwave Monitoring Station;
- would affect more biological resources and forest resources in the wetland northwest of Richmond and in the Stony Swamp;
- would cross a licensed pit and an aggregate resource area at Regional Road 5 in Goulbourn Township.
- would cost approximately $800,000 more than O_1Y.

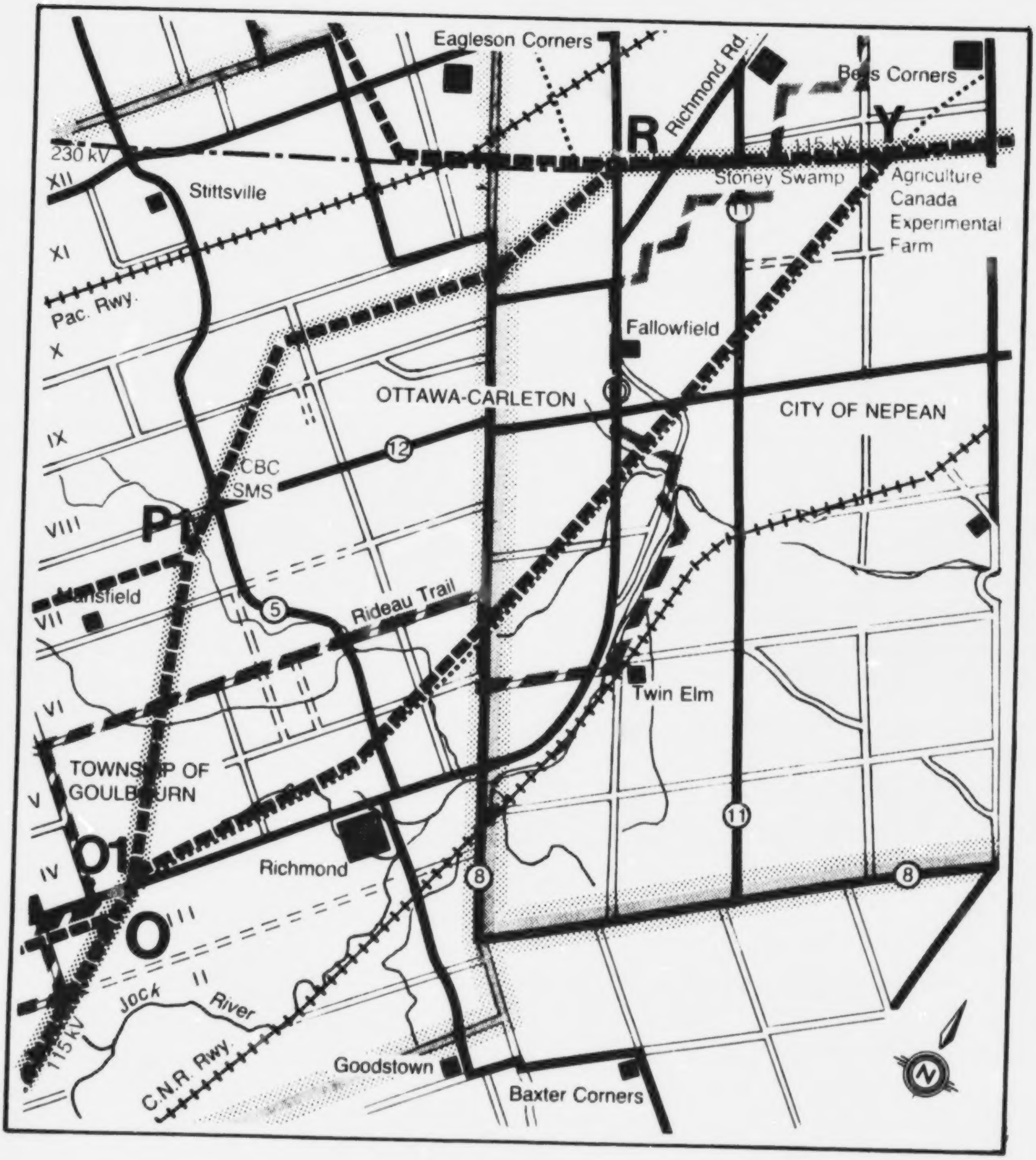

Eagleson Corners
Richmond Rd.
Bells Corners
R
Y
230 kV
115 kV
XII
Stittsville
Stoney Swamp
11
Agriculture Canada Experimental Farm
XI
Pac. Rwy.
X
Fallowfield
OTTAWA-CARLETON
CITY OF NEPEAN
IX
12
CBC SMS
VIII
P
Mansfield
5
Rideau Trail
VII
Twin Elm
VI
TOWNSHIP OF GOULBOURN
V
O1
IV
Richmond
11
8
8
O
III
II
Jock
River
115 kV
C.N.R. Rwy.
Goodstown
Baxter Corners

Figure 6.5
O_1, P_1, RY vs O_1Y

Scale
0 1 2 km

Table 6.3 Northern Sub-Route Evaluation O_1, P_1, RY vs O_1, Y Land Use and Environment

		01 P1 R Y	01 Y
		2-LINES	2-LINES CONSOLIDATED
LENGTH (km)	Sub-Route Length	21 6	19 2
FACTOR	Data Types		
AGRICULTURAL RESOURCES	Area of tower base in grain & forage crops (ha)	2 5	1 9
	Land in market gardening (km)	-	-
	Land in tile drainage (km)	4 9	5 9
	Area of tower base in pasture land (ha)	0 4	-
	Length of agricultural land crossed (km)	8 9	12 0
APPEARANCE OF THE LANDSCAPE	Landscape types crossed (km)		
	- natural	7 0	2 9
	- river valley	-	-
	- farming	13 7	14 5
	- abandoned farming	0 9	1 3
	- urban	-	-
	Number of crests affected		
	- minor	5	1
	- major	-	1
	- dominant	-	-
	Number of long views	-	-
	Length within viewshed of scenic roads (km)	-	-
	Number of road crossings		
	- right angle	4	2
	- diagonal	6	10
	Number of homes within line viewshed	624	672
	Viewshed of proposed transmission line(s) (ha)	14995	14875
BIOLOGICAL RESOURCES	Sensitive significant biological areas (ha)	16 8	19 0
	Primary upland wildlife waterfowl habitat (ha)	2 5	10 5
	Secondary upland wildlife habitat (ha)	18 0	5 9
	Wetlands with no known biological information (ha)	43 8	8 8
	Number of vegetated stream river crossings	3	1
FOREST RESOURCES	Area of sugar bush and semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha)	2 4	2 0
	Area of forest management, mature semi-mature upland hardwoods (FRI site classes 3 and 4) and semi-mature conifer and mature/semi-mature lowland hardwood stands (FRI site classes 1 and 2) (ha)	4 8	1 3
	Area of young plantations, mature semi-mature lowland hardwoods (FRI site classes 3 and 4 and semi-mature conifer stands (FRI site classes 3 and 4) (ha)	41 3	14 2
	Area of young pioneer hardwoods, conifers and lowland hardwood stands (ha)	28 8	18 8
	Area of mature conifers and scattered forest stands (ha)	8 6	4 2
HERITAGE RESOURCES	Viewsheds of historic communities (ha)	14995	14875
	Number of known archaeological sites	-	-
	Area of reported but unsubstantiated and high archaeological site potential (ha)	7 0	7 0
HUMAN SETTLEMENT	Number of permanent residential buildings		
	- removals	-	1
	- in proximity	1	5
	Number of seasonal residential buildings		
	- removals	-	1
	- in proximity	-	-
	Number of farm houses and barns		
	- removals	-	1
	- in proximity	-	3
	Number of farm outbuildings removed	-	-
	Number of commercial facilities removed	-	1
	Number of proposed industrial developments	-	-
	Length of right of way (not owned by O.H.)		
	- diagonal to property fabric (km)	11 2	16 1
	- parallel to property fabric (km)	7 6	-
	- on or adjacent to property fabric (km)	2 8	3 1
	Number of properties affected		
	- diagonal to property fabric	27	43
	- parallel to property fabric	10	-
	- on or adjacent to property fabric	17	22
MINERAL RESOURCES	Area of existing pits and quarries (ha)	4 2	-
	Area of high aggregate resource potential (ha)	8 7	-
	Area of high industrial mineral potential (ha)	-	-
	Number of sensitive/unique geologic features	-	-
RECREATION RESOURCES	Length within viewshed of Rideau Canal (km)	-	-
	Proximity to Rideau Canal locks (km)	-	-
	Length within viewshed of private campgrounds (km)	-	-
	Length within viewshed of NCC recreation lands, Provincial Parks, Conservation Areas (km)	5 1	17 5
	Length within viewshed of cottage lakes (km)	-	-
	Length within viewshed canoe routes (km)	-	-
	Length within viewshed of foot trails (km)	15.0	12 2
	Number of ski trails crossed	2	1
COST	$ Million (1984 NPW)	16.0	15.2

6.4.1.2 MNPP$_1$ vs MOO$_1$P$_1$ (Figure 6.6 and Table 6.4)

Sub-Route MOO$_1$P$_1$ was preferred because it had the following advantages:

- would require fewer large angle towers on actively cultivated farm land and cross less agricultural land;
- would be fewer homes in proximity;
- would be visible to fewer residences and farms;
- would be farther away from, but still within the viewsheds, of the historic community of Stapleton and from the historic log and limestone buildings concentrated in the area;
- would affect less area of high aggregate reserve potential;
- would avoid the viewsheds of private campgrounds and be less visible from the Rideau Trail.

The advantages of MOO$_1$P$_1$ outweighed the following disadvantages:

- would affect more biological and forest resources in the wetland northwest of Richmond;
- would involve more difficult access for construction and maintenance.

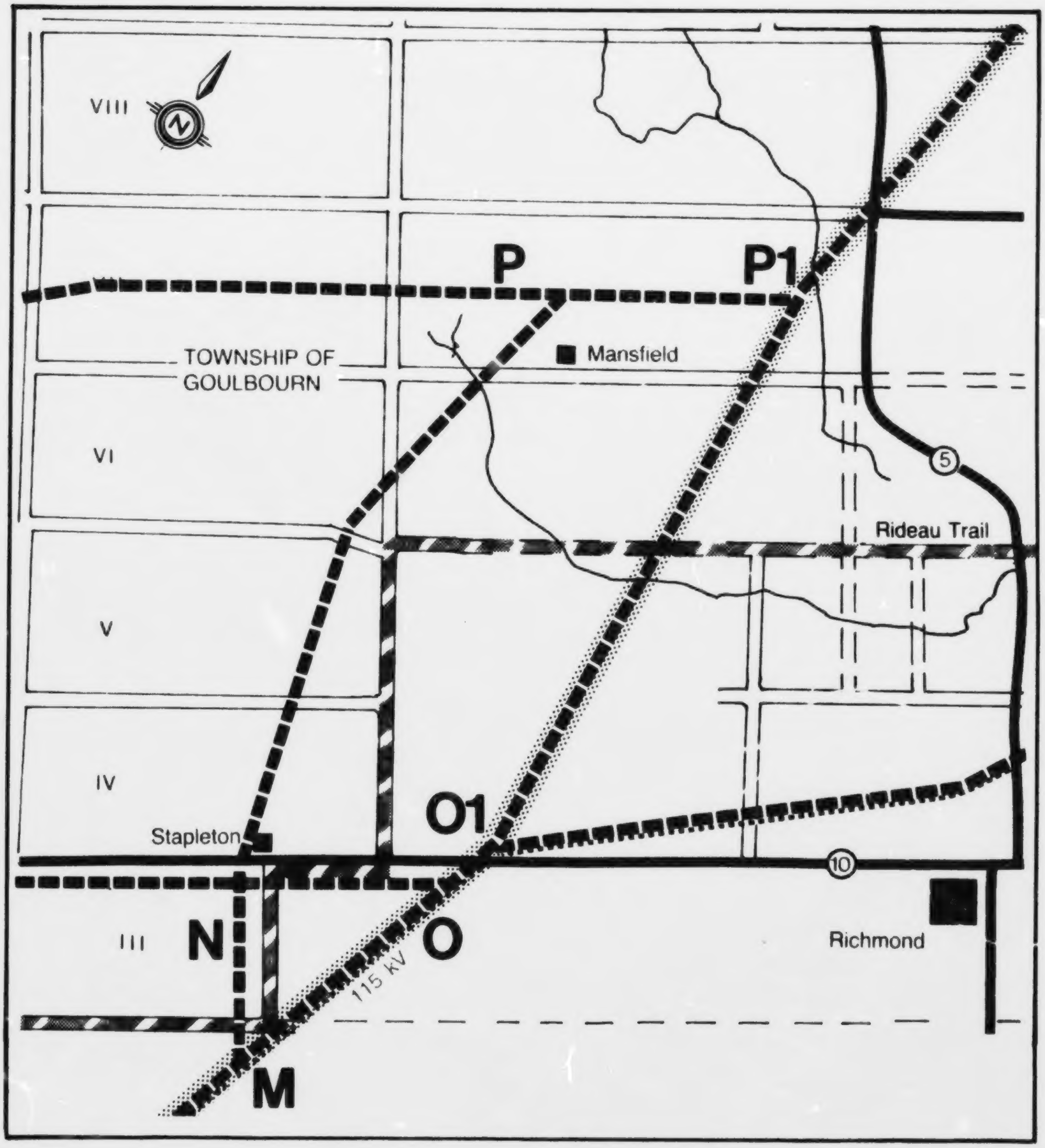

VIII
N
P
P1
TOWNSHIP OF GOULBOURN
Mansfield
VI
5
Rideau Trail
V
IV
O1
Stapleton
10
III
N
O
115 kV
Richmond
M

Figure 6.6
MNPP$_1$ vs MOO$_1$P$_1$

Scale
0
1
2 km

Table 6.4 Northern Sub-Route Evaluation MNPP, vs MOO, P, Land Use and Environment

		M N P P1	M O 01 P1
		2-LINES	2-LINES
LENGTH (km)	Sub-Route Length	9 4	8 2
FACTOR	Data Types		
AGRICULTURAL RESOURCES	Area of tower base in grain & forage crops (ha)	2 0	0 7
	Land in market gardening (km)	.	.
	Land in tile drainage (km)	0 3	0 5
	Area of tower base in pasture land (ha)	0 6	0 1
	Length of agricultural land crossed (km)	6 4	2 5
APPEARANCE OF THE LANDSCAPE	Landscape types crossed (km)		
	- natural	0 6	4 9
	- river valley	-	-
	- farming	7 4	3 3
	- abandoned farming	1 4	-
	- urban	-	-
	Number of crests affected		
	- minor	6	-
	- major	-	1
	- dominant	-	-
	Number of long views	-	-
	Length within viewshed of scenic roads (km)	-	-
	Number of road crossings		
	- right angle	5	-
	- diagonal	1	3
	Number of homes within line viewshed	195	150
	Viewshed of proposed transmission line(s) (ha)	6724	5633
BIOLOGICAL RESOURCES	Sensitive/significant biological areas (ha)	-	-
	Primary upland wildlife/waterfowl habitat (ha)	10 5	-
	Secondary upland wildlife habitat (ha)	9 2	-
	Wetlands with no known biological information (ha)	-	48 3
	Number of vegetated stream/river crossings	-	4
FOREST RESOURCES	Area of sugar bush and semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha)	-	-
	Area of forest management, mature/semi-mature upland hardwoods (FRI site classes 3 and 4) and semi-mature conifer and mature/semi-mature lowland hardwood stands (FRI site classes 1 and 2) (ha)	7 3	1 1
	Area of young plantations, mature/semi-mature lowland hardwoods (FRI site classes 3 and 4 and semi-mature conifer stands (FRI site classes 3 and 4) (ha)	4 2	26 1
	Area of young pioneer hardwoods, conifers and lowland hardwood stands (ha)	10 5	13 4
	Area of mature conifers and scattered forest stands (ha)	5 5	1 5
HERITAGE RESOURCES	Viewsheds of historic communities (ha)	6724	1028
	Number of known archaeological sites	-	-
	Area of reported but unsubstantiated and high archaeological site potential (ha)	18 0	8 0
HUMAN SETTLEMENT	Number of permanent residential buildings		
	- removals	-	-
	- in proximity	1	-
	Number of seasonal residential buildings		
	- removals	-	-
	- in proximity	-	-
	Number of farm houses and barns		
	- removals	-	-
	- in proximity	5	1
	Number of farm outbuildings removed	-	-
	Number of commercial facilities removed	-	-
	Number of proposed industrial developments	-	-
	Length of right of way (not owned by O.H.)		
	- diagonal to property fabric (km)	5 3	6 9
	- parallel to property fabric (km)	2 0	-
	- on or adjacent to property fabric (km)	2 1	1 3
	Number of properties affected		
	- diagonal to property fabric	10	17
	- parallel to property fabric	5	-
	- on or adjacent to property fabric	7	7
MINERAL RESOURCES	Area of existing pits and quarries (ha)	-	-
	Area of high aggregate resource potential (ha)	7 3	2 0
	Area of high industrial mineral potential (ha)	.	.
	Number of sensitive/unique geologic features	.	.
RECREATION RESOURCES	Length within viewshed of Rideau Canal (km)	.	.
	Proximity to Rideau Canal locks (km)	.	.
	Length within viewshed of private campgrounds (km)	6 2	.
	Length within viewshed of NCC recreation lands, Provincial Parks, Conservation Areas (km)	.	.
	Length within viewshed of cottage lakes (km)	.	.
	Length within viewshed canoe routes (km)	.	.
	Length within viewshed of foot trails (km)	9 4	4 9
	Number of ski trails crossed	.	.
COST	$ Million (1984 NPW)	5.2	5.1

6.4.1.3 $KNOO_1P_1$ vs KPP_1 (Figure 6.7 and Table 6.5)

Sub-Route KPP_1 was preferred because it had the following advantages:

- would be further away from, and less visible to, residents in the historic communities of Prospect and Stapleton, and along the historic Perth-Ottawa settlement road;
- would be less conspicuous to users of the Rideau Trail;
- would avoid the viewsheds of private campgrounds;
- would have less effect on areas of high archaeological site potential;
- would cost $500,000 less.

The advantages of KPP_1 outweighed the following disadvantages:

- would have a greater effect on the Prospect Bog ecosystem than KOO_1P_1 would have on the wetland northwest of Richmond;
- would be in proximity to three residences;
- would have a greater potential effect on areas of high aggregate reserve.

6.4.1.4 Conclusions

In the north sub-route comparison between point K and Y, links KPP_1RY were the preferred links to be added to the Red Route. In the north sub-route comparison between point M and Y, links MOO_1P_1RY, were the preferred links to be added to the Green, Orange, Yellow Purple, and Brown Routes.

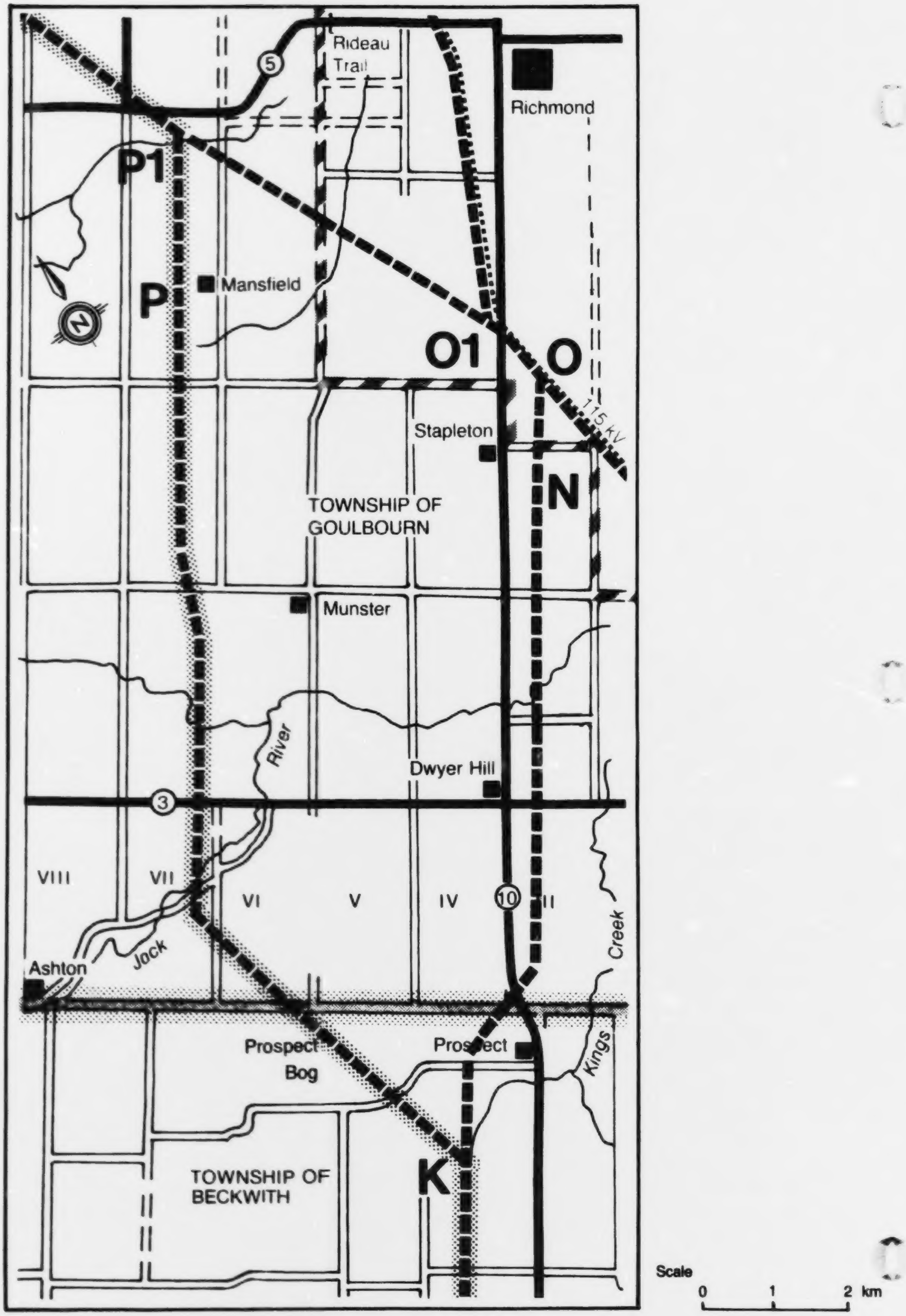

Rideau Trail
5
Richmond
P1
P
Mansfield
N
O1
O
115 kV
Stapleton
N
TOWNSHIP OF GOULBOURN
Munster
River
Dwyer Hill
3
VIII
VII
VI
V
IV
10
II
Jock
Ashton
Creek
Kings
Prospect Bog
Prospect
K
TOWNSHIP OF BECKWITH
Scale
0
1
2 km

Figure 6.7
KPP1 vs KNOO1P1

Table 6.5 Northern Sub-Route Evaluation KNOO, P, vs KPP, Land Use and Environment

		K N O 01 P1	K P P1
		2-LINES	2-LINES
LENGTH (km)	Sub-Route Length	18 3	17 0
FACTOR	Data Types		
AGRICULTURAL RESOURCES	Area of tower base in grain & forage crops (ha)	2 2	1 7
	Land in market gardening (km)	0 2	-
	Land in tile drainage (km)	1 7	1 8
	Area of tower base in pasture land (ha)	0 6	0 9
	Length of agricultural land crossed (km)	8 4	9 3
APPEARANCE OF THE LANDSCAPE	Landscape types crossed (km)		
	- natural	7 2	3 5
	- river valley	-	-
	- farming	12 1	13 5
	- abandoned farming	-	-
	- urban	-	-
	Number of crests affected		
	- minor	8	4
	- major	-	1
	- dominant	-	-
	Number of long views	-	-
	Length within viewshed of scenic roads (km)	-	-
	Number of road crossings		
	- right angle	6	3
	- diagonal	3	4
	Number of homes within line viewshed	267	301
	Viewshed of proposed transmission line(s) (ha)	6533	6276
BIOLOGICAL RESOURCES	Sensitive/significant biological areas (ha)	-	13 0
	Primary upland wildlife/waterfowl habitat (ha)	-	16 0
	Secondary upland wildlife habitat (ha)	12 1	15 6
	Wetlands with no known biological information (ha)	58 6	16 5
	Number of vegetated stream/river crossings	3	1
FOREST RESOURCES	Area of sugar bush and semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha)	-	-
	Area of forest management, mature/semi-mature upland hardwoods (FRI site classes 3 and 4) and semi-mature conifer and mature/semi-mature lowland hardwood stands (FRI site classes 1 and 2) (ha)	3 5	-
	Area of young plantations, mature/semi-mature lowland hardwoods (FRI site classes 3 and 4 and semi-mature conifer stands (FRI site classes 3 and 4) (ha)	24 5	23 4
	Area of young pioneer hardwoods, conifers and lowland hardwood stands (ha)	39 0	43 3
	Area of mature conifers and scattered forest stands (ha)	1 5	4 1
HERITAGE RESOURCES	Viewsheds of historic communities (ha)	6533	6276
	Number of known archaeological sites	-	
	Area of reported but unsubstantiated and high archaeological site potential (ha)	41 0	22 0
HUMAN SETTLEMENT	Number of permanent residential buildings		
	- removals	-	-
	- in proximity	-	3
	Number of seasonal residential buildings		
	- removals	-	-
	- in proximity	-	-
	Number of farm houses and barns		
	- removals	-	-
	- in proximity	1	-
	Number of farm outbuildings removed	-	-
	Number of commercial facilities removed	-	-
	Number of proposed industrial developments	-	-
	Length of right of way (not owned by O.H.)		
	- diagonal to property fabric (km)	6 5	6 7
	- parallel to property fabric (km)	9 0	8 5
	- on or adjacent to property fabric (km)	2 8	1 8
	Number of properties affected		
	- diagonal to property fabric	15	14
	- parallel to property fabric	28	31
	- on or adjacent to property fabric	16	14
MINERAL RESOURCES	Area of existing pits and quarries (ha)	-	-
	Area of high aggregate resource potential (ha)	4 5	18 6
	Area of high industrial mineral potential (ha)	-	-
	Number of sensitive/unique geologic features	-	-
RECREATION RESOURCES	Length within viewshed of Rideau Canal (km)	-	-
	Proximity to Rideau Canal locks (km)	-	-
	Length within viewshed of private campgrounds (km)	3 4	-
	Length within viewshed of NCC recreation lands, Provincial Parks, Conservation Areas (km)	-	-
	Length within viewshed of cottage lakes (km)	-	-
	Length within viewshed canoe routes (km)	-	-
	Length within viewshed of foot trails (km)	8 2	2 0
	Number of ski trails crossed	-	-
COST	$ Million (1984 NPW)	11.3	10.8

6.4.2 South Area Sub-Routes (Refer to Figure 6.8 and Table 6.6)

In the south, the links between points A to I were combined to create four sub-routes, namely the Orange, Purple, Yellow, and Brown. These sub-routes were evaluated and then compared to determine if any links could be eliminated from further study.

6.4.2.1 Evaluation

This section outlines the significant aspects of the four sub-route evaluations. The potential effects associated with each sub-route are presented in Table 6.6.

Orange Sub-Route (ABEGHI)

Land Use and Environment

- would have a disruptive influence on farm operations resulting from the addition of a third and in some areas a fourth set of transmission towers in fields, primarily in Portland, North Crosby, South Crosby and Bastard townships;
- would be visible to a large number of residents living in the vicinity of the transmission lines;
- would directly affect 15 residences, cottages and farms and one cemetery, and would be in proximity to another 25 buildings near the existing lines; primarily in Portland Township and between Newboro and Portland;
- would marginally affect several large wetland complexes - Millhaven, Cameron, Cooligan and Stinson swamps;
- would affect five maple sugar bushes, with 2.1 ha removed;
- would further affect a large area of potential industrial mineral reserve, and a karst feature (Godfrey Crystal Cave) along the existing line;
- would cross the Rideau Canal System adjacent to two existing transmission lines at Newboro where the canal is a narrow man-made channel.

Socio-Economic and Public Involvement

- with two or three transmission lines already, Portland Township and the hamlets of Newboro and Portland may not be able to accommodate two additional transmission lines without further altering the character of those communities;
- additional lines may affect the economic viability of farm operations which currently have two or three transmission lines.

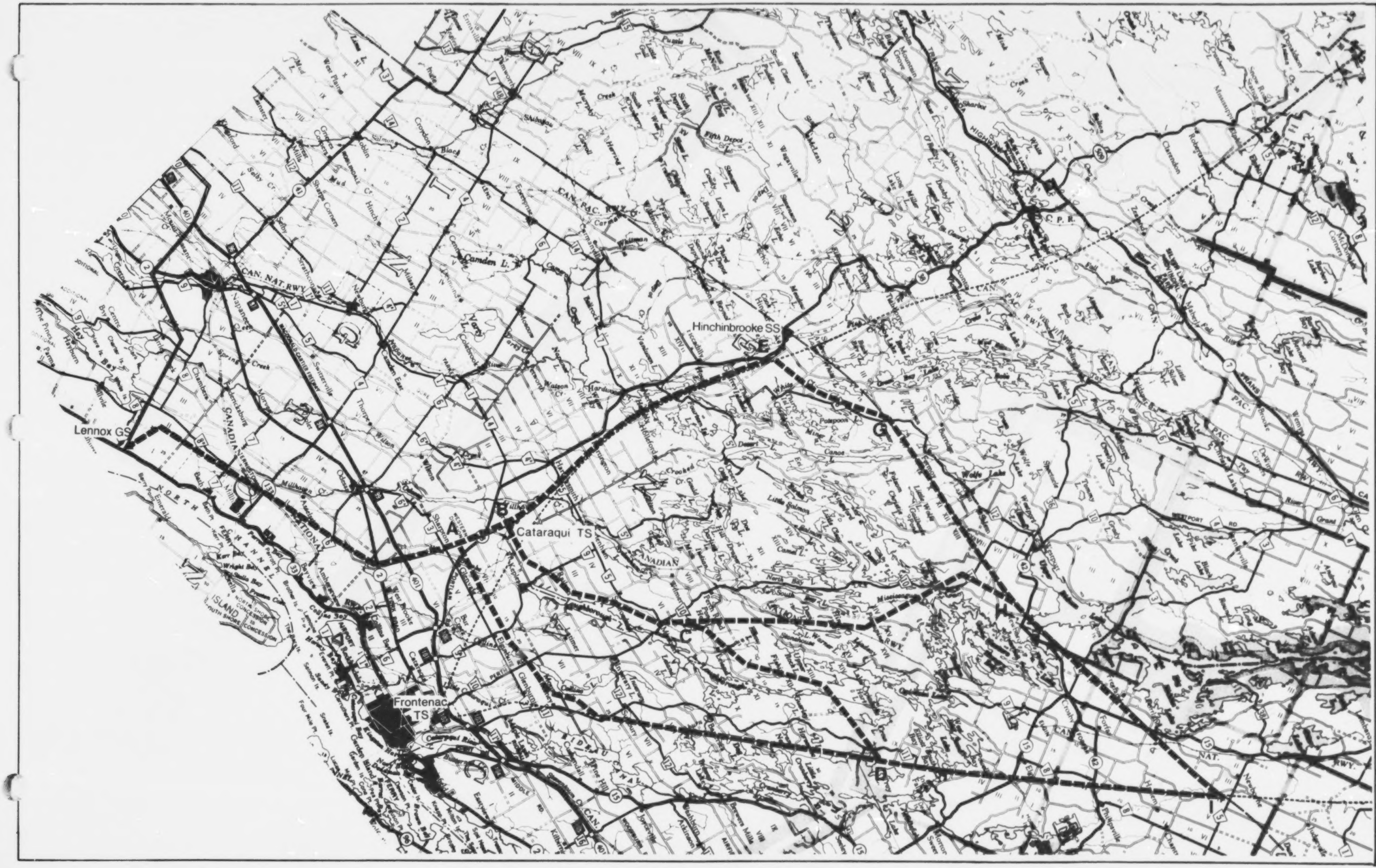

Lennox GS
Hinchinbrooke SS
Cataraqui TS
Frontenac TS
A
B
C
D
E
G
H
I
Scale 1:250,00
5
5

Figure 6.8
South Area S

Legend
Ex
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Al
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Eastern Ontar
West Section

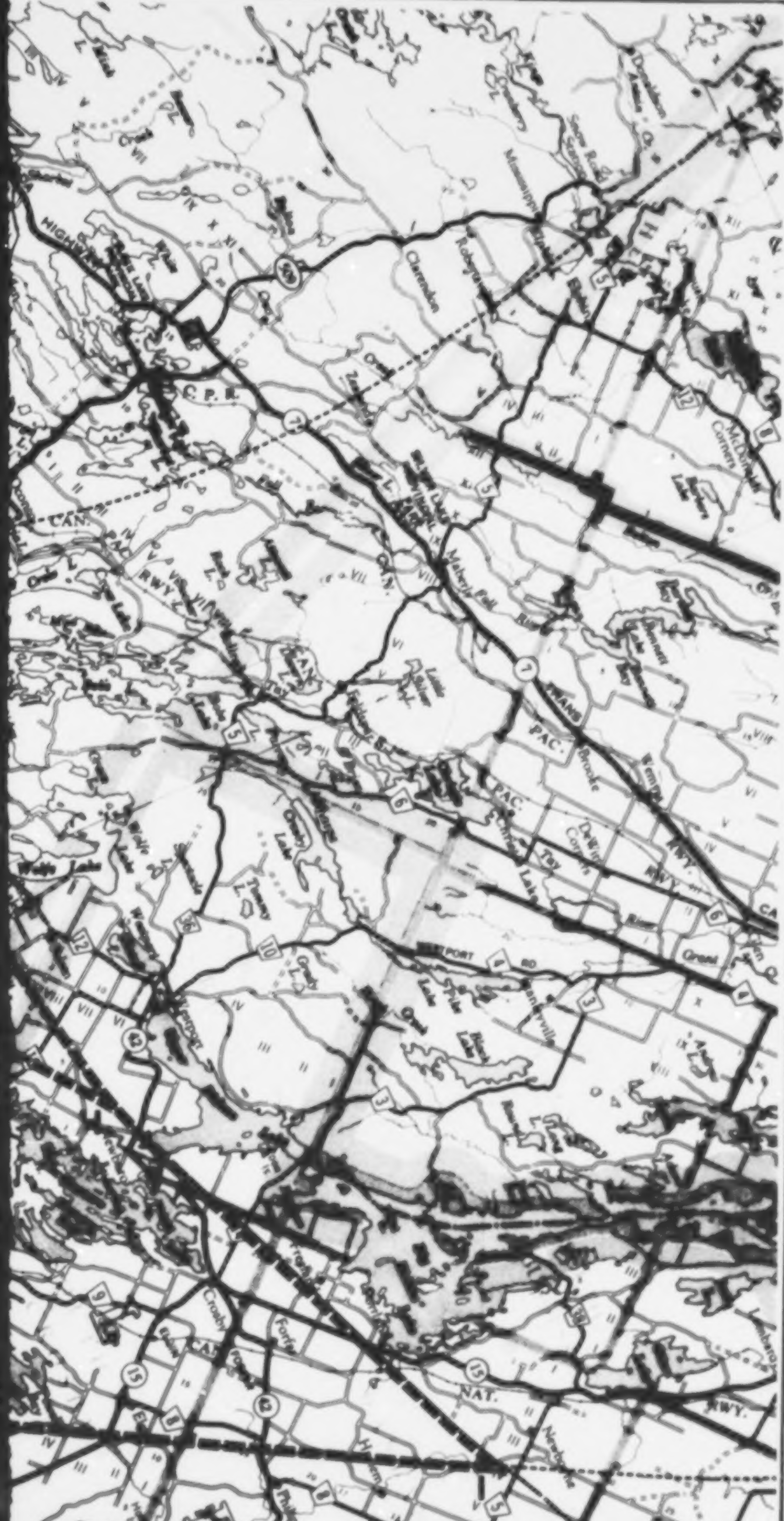

HIGHWAY
C.P.R.
CAN.
PAC.
RWY.
TRANS
Clarendon
Mississippi
Maberly
Fall River
Brooke
Wemyss
Tay River
Wolfe Lake
WESTPORT
RD
Crosby
NAT.
RWY.
Philipsville
509
7
5
6
12
10
36
42
15
38
3
8
4

Figure 6.8
South Area Sub-Routes

Legend

▬ Existing 500 Line
— — Existing 230 kV Line
.... Existing 115 kV Line
■ Transformer or Switching Station
▲ Generating Station
▬ ▬ ▬ Alternative Sub-Routes
A Route Intersection

Alternative sub-routes
are not drawn to scale

Scale 1:250,000

5 0 5 Miles
5 0 5 Kilometres

Eastern Ontario Study
West Section

Table 6.6 Southern Sub-Route Evaluation Between Point A and I Land Use and Environment

		ADI	ABCDI	ABCHI	ABEGHI
		BROWN	YELLOW	PURPLE	ORANGE
LENGTH (km)	Sub-Route Length	66.3	65.6	67.4	77.2
FACTOR	Data Types				
AGRICULTURAL RESOURCES	Area of tower base in grain & forage crops (ha)	2.5	1.9	2.6	2.7
	Land in market gardening (km)	0.3	0.3		-
	Land in tile drainage (km)	2.4	0.4	0.9	0.9
	Area of tower base in pasture land (ha)	1.0	0.9	1.0	1.5
	Length of agricultural land crossed (km)	17.0	9.5	11.7	21.1
APPEARANCE OF THE LANDSCAPE	Landscape types crossed (km)				
	- natural	22.1	35.4	26.9	23.4
	- river valley	0.8	-	0.0	1.8
	- farming	36.4	20.0	30.0	43.5
	- abandoned farming	7.0	10.4	9.6	8.5
	- urban	-			-
	Number of crests affected				
	- minor	38	27	27	34
	- major	36	32	39	98
	- dominant	-	-		1
	Number of long views	1		-	
	Length within viewshed of scenic roads (km)	14.7	3.0	5.2	2.1
	Number of road crossings				
	- right angle	15	12	9	19
	- diagonal	16	14	16	14
	Number of homes within line viewshed	743	663	845	1011
	Viewshed of proposed transmission line(s) (ha)	11911	11953	15050	16580
BIOLOGICAL RESOURCES	Sensitive significant biological areas (ha)	13.0	-	7.5	-
	Primary upland wildlife waterfowl habitat (ha)	28.3	70.1	85.6	65.0
	Secondary upland wildlife habitat (ha)	202.0	290.6	253.1	238.1
	Wetlands with no known biological information (ha)	21.2	35.1	46.3	34.1
	Number of vegetated stream river crossings	9	11	7	12
FOREST RESOURCES	Area of sugar bush and semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha)	68.5	55.9	67.6	45.1
	Area of forest management, mature semi-mature upland hardwoods (FRI site classes 3 and 4) and semi-mature conifer and mature semi-mature lowland hardwood stands (FRI site classes 1 and 2) (ha)	43.4	110.2	128.0	95.4
	Area of young plantations, mature semi-mature lowland hardwoods (FRI site classes 3 and 4 and semi-mature conifer stands (FRI site classes 3 and 4) (ha)	37.3	74.5	79.6	84.5
	Area of young pioneer hardwoods, conifers and lowland hardwood stands (ha)	78.1	75.3	65.8	83.8
	Area of mature conifers and scattered forest stands (ha)	2.3		0.6	5.9
HERITAGE RESOURCES	Viewsheds of historic communities (ha)	11911	10077	13239	12783
	Number of known archaeological sites	-	-	-	-
	Area of reported but unsubstantiated and high archaeological site potential (ha)	43.0	19.0	20.0	13.0
HUMAN SETTLEMENT	Number of permanent residential buildings				
	- removals	6	1	3	10
	- in proximity	18	8	6	11
	Number of seasonal residential buildings				
	- removals	2	2	-	-
	- in proximity	2	1	-	1
	Number of farm houses and barns				
	- removals	2	-	3	5
	- in proximity	8	3	2	13
	Number of farm outbuildings removed	3	-	2	5
	Number of commercial facilities removed	-	-	-	-
	Number of proposed industrial developments	-	-	-	-
	Length of right of way (not owned by O.H.)				
	- diagonal to property fabric (km)	45.6	48.2	51.7	60.7
	- parallel to property fabric (km)	12.4	7.3	7.8	3.3
	- on or adjacent to property fabric (km)	8.3	6.4	5.0	9.3
	Number of properties affected				
	- diagonal to property fabric	98	87	104	119
	- parallel to property fabric	46	12	18	6
	- on or adjacent to property fabric	46	39	32	35
MINERAL RESOURCES	Area of existing pits and quarries (ha)	-	-	5.6	1.8
	Area of high aggregate resource potential (ha)	9.6	-	-	-
	Area of high industrial mineral potential (ha)	91.1	-	74.0	74.0
	Number of sensitive unique geologic features	-	-	1	1
RECREATION RESOURCES	Length within viewshed of Rideau Canal (km)	12.0	4.9	11.2	11.2
	Proximity to Rideau Canal locks (km)	0.5	0.5	0.9	0.9
	Length within viewshed of private campgrounds (km)	-	9.4	11.6	7.0
	Length within viewshed of NCC recreation lands, Provincial Parks, Conservation Areas (km)	-	-	4.5	14.4
	Length within viewshed of cottage lakes (km)	20.0	19.8	31.0	24.0
	Length within viewshed canoe routes (km)	12.0	4.9	14.0	13.9
	Length within viewshed of foot trails (km)	2.8	3.5	15.0	24.0
	Number of ski trails crossed	-	-	-	-
COST	$ Million (1984 NPW)	**38.7**	**36.6**	**39.0**	**45.0**
	Potential Additional Costs ($ Million 1984 NPW)	**2.7**	**1.3**	**1.3**	**4.8**

7.7

Cost/Technical

- would require consolidation with the existing 115 kV line in Portland Township and the existing 230 kV line in North Crosby and Bastard townships;
- would require the new lines to cross over the existing 2-cct 230 kV line south of Cataraqui TS and the two existing 230 kV lines at point G in Bedford Township;
- access would be difficult in parts of Portland and Bedford townships;
- would cost $45 million to construct;
- the additional cost of narrow base towers and potential property acquisition would be approximately $4.9 million.

Purple Sub-Route (ABCHI)

Land Use and Environment

- would cross intermittent areas of actively cultivated farm land in Loughborough Township; the disruptive influence on farm operation in North and South Crosby and Bastard townships would be the same as described in Orange Sub-Route;
- would contrast with the natural landscape south of Bedford Mills in Bedford and Storrington townships;
- would be within the viewshed of portions of Loughborough Lake;
- would cross the historic Perth Road three times and the Rideau Trail seven times;
- would directly affect 6 residences and farms, and would be in proximity to another 8, primarily between Newboro and Portland;
- would affect a small amount of waterfowl breeding and nesting area at Barretts Bay on Loughborough Lake;
- would affect one heronry, several wetlands, and wildlife habitat in the undisturbed lands in Storrington and Bedford townships;
- would require clearing of mixed forest land, primarily in Storrington and Bedford townships;
- would affect three maple sugar bushes, with 2.7 ha removed;
- would create new right of way within the viewsheds of the historic community of Bedford Mills;
- would affect a large area of existing pits, potential industrial mineral reserve, and a karst feature (Stonehouse Lake, limestone cave);

- would have a long length within the viewsheds of cottage lakes, such as Loughborough and Loon lakes;
- would affect the Skycroft Family Campground in Bedford Township;
- would cross the Rideau Canal adjacent to two existing transmission lines at Newboro where the canal is a narrow man-made channel.

Socio-Economic and Public Involvement

- lines may detract from the recreational experience of users of the natural recreation facilities in the Bedford Mills area;
- lines may be viewed as an undesirable presence in the natural, rural setting of the Loughborough Lake community;
- lines may detract from the recreational experience of users of Loughborough Lake.

Cost/Technical

- would require the new lines to cross over the existing 2-cct 230 kV line south of Cataraqui TS and the two existing 230 kV lines between points H and I in North Crosby and Bastard townships;
- access would be difficult between points C and H;
- would cost $39 million to construct;
- the additional cost of narrow base towers and potential property acquisition would be approximately $1.3 million.

Yellow Sub-Route (ABCDI)

Land Use and Environment

- would cross intermittent areas of actively cultivated farm land in Loughborough, South Crosby and Bastard townships;
- would be within the viewshed of portions of Loughborough Lake;
- would require clearing of upland hardwood forest land, mainly in Storrington Township;
- would affect one maple sugar bush, with 0.9 ha removed;
- would affect a small amount of a waterfowl breeding and nesting area at Barretts Bay on Loughborough Lake, and secondary wildlife habitat in Storrington Township;

- would directly affect 3 residences and cottages, and be in proximity to another 12 buildings, primarily in South Crosby Township;
- would cross the Hewlett-Packard (Canada) Ltd. recreational property in Storrington Township, but would be outside the viewshed of the recreation lakes and associated developments;
- would cross the Rideau Canal in the vicinity of Jones Falls within the viewshed of historic buildings and the upper lock.

Socio-Economic and Public Involvement

- lines may detract from the recreational experience of users of the Rideau Canal at Jones Falls, cottagers on the lower end of Sand Lake, and tourists who travel on County Road 11 near Jones Falls;
- lines may be viewed as an undesirable presence in the natural, rural setting of the Loughborough Lake community.

Cost/Technical

- new lines would have to cross over existing 2-cct 230 kV line south of Cataraqui TS;
- access would be difficult between points C and D;
- would cost $36.6 million to construct;
- the additional cost of narrow base towers and potential property acquisition would be approximately $1.3 million.

Brown Sub-Route (ADI)

Land Use and Environment

- would cross high capability agricultural land in tile drainage and would require a second set of transmission towers in fields, diagonal to field patterns;
- would have a long length within the viewshed of the Rideau Canal System;
- would cross the Rideau Canal in the vicinity of Jones Falls within the viewshed of the historic buildings and the upper lock;
- would cross the Collins Creek floodplain with towers placed in the floodplain;
- would affect one maple sugar bush, with 0.1 ha potentially removed;
- would cross an extensive area of high archeological site potential;

- would directly affect 10 residences, cottages and farms, and would be in proximity to another 28 buildings, primarily in Storrington and South Crosby townships;

- would affect a large area of potential industrial mineral reserve in Storrington Township.

Socio-Economic and Public Involvement

- lines may conflict with the character of the agricultural community in the Mount Chesney area;

- lines may detract from the recreational experience of users of the Rideau Canal at Jones Falls, cottagers on the lower end of Sand Lake, and tourists who travel on County Road 11 near Jones Falls.

Cost/Technical

- would require consolidation with the existing 115 kV line north of Mount Chesney to Battersea;

- would require the new lines to cross over the existing 2-cct 230 kV line south of Cataraqui TS;

- construction access roads would be difficult to build north of Battersea;

- the new lines would parallel Bell Canada cable between Mt. Chesney and Battersea, creating potential technical problems;

- would cost $38.7 million to construct;

- the additional cost of narrow base towers and potential property acquisition would be approximately $2.7 million.

6.4.2.2 Comparison

The Purple Sub-Route would have the highest potential effects on biological, forest, heritage, and mineral resources, and no particular environmental advantages. The majority of these potential effects were encountered on the CH and HI links. The Purple Sub-Route would also be the second most costly of the four sub-routes. For these reasons, the Purple Sub-Route was dropped from further consideration.

The Orange Sub-Route would have high potential effects on agriculture, human settlement, and mineral resources. Although this sub-route would maximize the use of existing rights of way, additional towers on some properties would create problems to farming in Portland, North Crosby, South Crosby, South Burgess and Bastard townships. The construction cost of this sub-route would be the highest among the four sub-routes. For these reasons, the Orange Sub-Route was removed from further consideration for two 500 kV transmission lines.

The Brown Sub-Route was then compared against the Yellow Sub-Route and the Yellow Sub-route was preferred because of the following advantages:

- would directly affect fewer residents and would be in proximity to fewer buildings along the right of way;
- would have less diagonal severance over high capability agricultural lands;
- would have less effect on viewsheds of historic communities;
- would avoid all areas of high industrial mineral potential;
- would avoid possible conflict with the character of the agricultural community in the Mount Chesney area;
- would have less effect on the viewshed of the Rideau Canal;
- would be $2.1 million less costly to construct and have $1.4 million less potential for additional costs.

The advantages of the Yellow Sub-Route over the Brown Sub-Route outweighed the following disadvantages:

- would require more new right of way;
- would be within the viewshed of portions of Loughborough Lake;
- would require more forest clearing;
- would cross the Hewlett-Packard (Canada) Ltd. recreational property.

6.4.2.3 Conclusions

The results of the southern sub-route evaluation and comparison were:

- the Yellow Sub-Route would have the least potential effects on the environment, although it had some high potential effects on appearance of the landscape and recreation resources. The cost of the Yellow Sub-Route was the lowest among the four sub-route alternatives. For these reasons, the Yellow Sub-Route was carried forward for further study;
- Brown, Orange and Purple Sub-Routes were dropped from further consideration for two lines;
- although the Brown and Orange Routes were dropped from further consideration for two lines, an alternative of one 500 kV line along the Brown Route and one 500 kV line along the Orange Route was developed because of suggestions to maximize consolidation with existing lines. This became the Brown/Orange Route and would involve construction of the first line along the Brown Route and the second line along the Orange.

6.5 Route Evaluation and Comparison (Level IV)

Based on the results of the foregoing comparisons, the remaining links were combined to form five alternative routes between point A and Y (Blue, Red, Green, Yellow and Brown/Orange) (Refer to Figure 6.9). A detailed evaluation and comparison was undertaken to determine the recommended route.

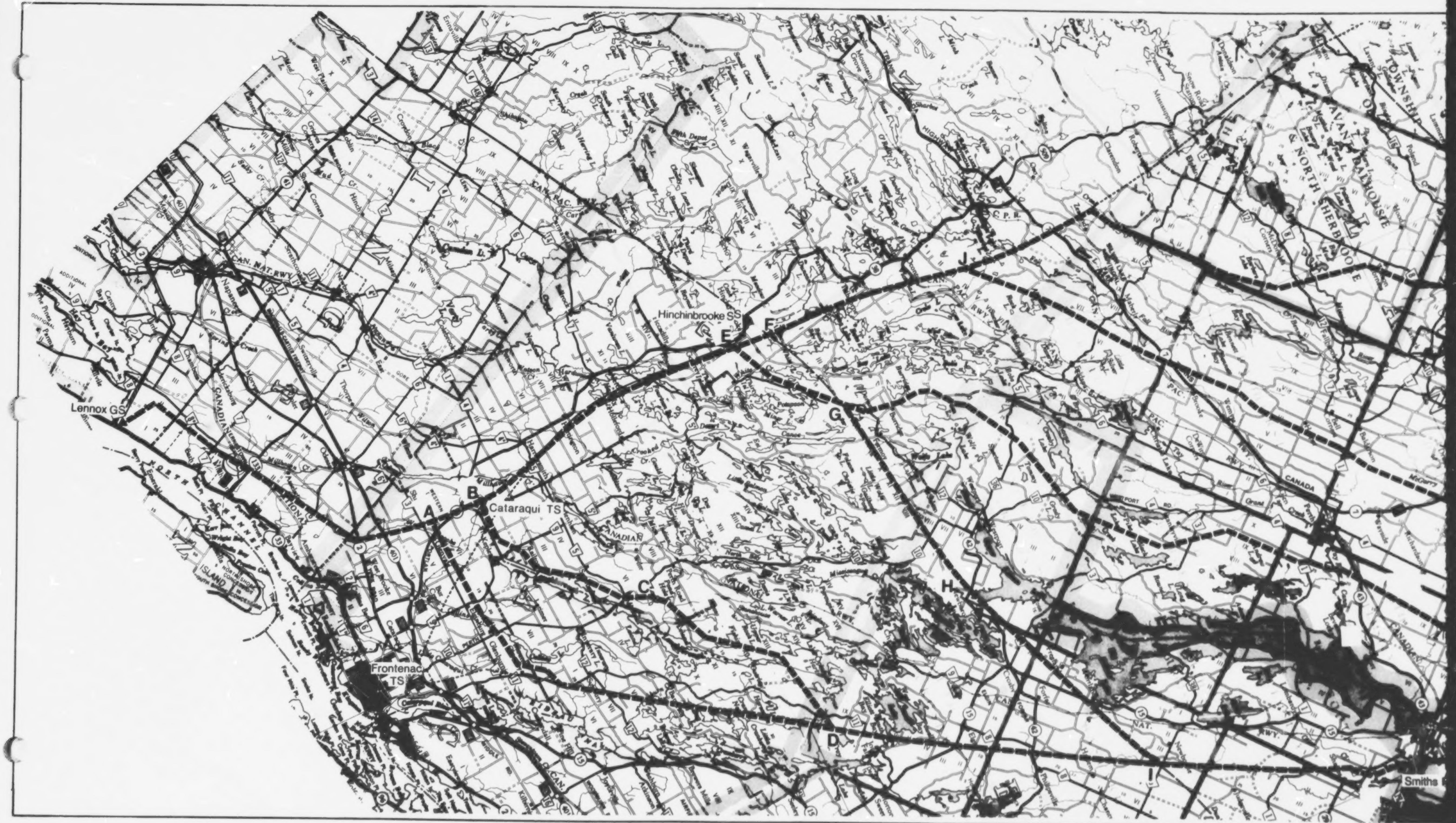
Although all the routes connect Lennox GS to Hawthorne TS, this evaluation only considered the routes from point A to Y. The link from Lennox GS to point A and the link from point Y to Hawthorne TS are common to all of the route alternatives.

6.5.1 Evaluation of Alternative Routes

The potential effects on the land use and environment are presented by data type and factor in Table 6.7. The potential socio-economic effects are described. Public concerns, technical and cost data are provided for each route. The cost and length of each route is summarized in Table 6.8.

Table 6.7 Route Evaluation Between Point A and Y Land Use and Environment

		BLUE	RED	GREEN	YELLOW	BROWN-ORANGE
		2-lines	2-lines	2-lines	2-lines	2-lines
LENGTH (km)	Route Length (A-Y)	150.9	144.8	145.3	139.0	216.7
FACTOR	Data Types					
AGRICULTURAL RESOURCES	Area of tower base in grain & forage crops ((ha)	5.2	7.0	5.8	5.6	6.1
	Land in market gardening (km)	-	-	-	0.3	0.3
	Land in tile drainage (km)	3.5	7.2	5.7	5.3	8.2
	Area of tower base in pasture land (ha)	2.3	3.0	2.4	1.8	2.0
	Length of agricultural land crossed (km)	34	39	35	35	63
APPEARANCE OF THE LANDSCAPE	Landscape types crossed (km)					
	- natural	67.6	69.2	57.3	53.3	63.4
	- river valley	13.4	1.8	6.7	-	2.6
	- farming	52.9	60.1	54.8	62.7	122.6
	- abandoned farming	16.6	13.7	26.5	21.2	26.3
	- urban	0.4	-	-	1.8	1.8
	Number of crests affected					
	- minor	66	45	48	67	105
	- major	159	116	85	36	115
	- dominant	4	1	1	-	1
	Number of long views	3	1	-	-	1
	Length within viewshed of scenic roads (km)	20.4	14.3	6.2	3.6	20.4
	Number of road crossings					
	- right angle	46	31	37	27	48
	- diagonal	19	25	31	35	51
	Number of homes within line viewshed	1564	1575	1427	1506	2597
	Viewshed of proposed transmission line(s) (ha)	42211	46354	42974	40822	57180
BIOLOGICAL RESOURCES	Sensitive/significant biological areas (ha)	38.7	118.5	28.0	48.6	56.4
	Primary upland wildlife/waterfowl habitat (ha)	105.6	153.7	184.4	146.0	120.6
	Secondary upland wildlife habitat (ha)	572.7	505.8	339.4	352.9	269.8
	Wetlands with no known biological information (ha)	89.7	183.0	174.4	95.1	78.5
	Number of vegetated stream/river crossings	28	18	13	17	26
FOREST RESOURCES	Area of sugar bush and semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha)	96.5	38.9	44.2	60.2	59.7
	Area of forest management, mature/semi-mature upland hardwoods (FRI site classes 3 and 4) and semi-mature conifer and mature/semi-mature lowland hardwood stands (FRI site classes 1 and 2) (ha)	191.0	162.7	149.4	155.0	116.6
	Area of young plantations, mature/semi-mature lowland hardwoods (FRI site classes 3 and 4 and semi-mature conifer stands (FRI site classes 3 and 4) (ha)	181.8	229.0	216.0	130.3	120.2
	Area of young pioneer hardwoods, conifers and lowland hardwood stands (ha)	208.2	295.1	275.3	241.6	252.0
	Area of mature conifers and scattered forest stands (ha)	66.7	71.2	38.8	13.0	17.7
HERITAGE RESOURCES	Viewsheds of historic communities (ha)	22601	23665	19240	19632	34249
	Number of known archaeological sites	-	-	-	-	-
	Area of reported but unsubstantiated and high archaeological site potential (ha)	18.0	103.0	44.0	34.0	71.0
HUMAN SETTLEMENT	Number of permanent residential buildings					
	- removals	10	7	7	5	12
	- in proximity	8	11	15	23	43
	Number of seasonal residential buildings					
	- removals	-	-	-	2	2
	- in proximity	1	1	1	1	3
	Number of farm houses and barns					
	- removals	4	2	1	1	3
	- in proximity	20	13	16	7	25
	Number of farm outbuildings removed	4	3	5	-	5
	Number of commercial facilities removed	-	-	-	-	-
	Number of proposed industrial developments	1	-	-	-	-
	Length of right of way (not owned by O.H.)					
	- diagonal to property fabric (km)	87.5	67.2	79.2	105.2	163.3
	- parallel to property fabric (km)	18.3	31.4	36.5	16.3	24.8
	- on or adjacent to property fabric (km)	41.2	42.4	25.7	13.5	24.7
	Number of properties affected					
	- diagonal to property fabric	188	136	169	252	382
	- parallel to property fabric	13	78	83	31	71
	- on or adjacent to property fabric	94	216	97	86	128
MINERAL RESOURCES	Area of existing pits and quarries (ha)	7.6	4.9	9.3	4.2	5.4
	Area of high aggregate resource potential (ha)	1.8	25.4	18.2	19.9	15.7
	Area of high industrial mineral potential (ha)	36.7	-	92.7	-	57.0
	Number of sensitive/unique geologic features	1	1	1	-	1
RECREATION RESOURCES	Length within viewshed of Rideau Canal (km)	-	-	2.7	10.0	28.3
	Proximity to Rideau Canal locks (km)	- - - -	- - - -	5.3 - - -	0.5 0.5 1.8 -	0.5 0.5 0.9 1.8
	Length within viewshed of private campgrounds (km)	1.5	3.7	1.2	9.4	7.0
	Length within viewshed of NCC recreation lands, Provincial Parks, Conservation Areas (km)	9.9	5.1	9.8	5.1	19.5
	Length within viewshed of cottage lakes (km)	15.9	15.6	13.5	19.8	44.0
	Length within viewshed canoe routes (km)	10.5	1.7	4.4	10.0	31.0
	Length within viewshed of foot trails (km)	21.4	24.4	40.7	34.3	57.6
	Number of ski trails crossed	2	2	2	2	2


Hinchinbrooke SS
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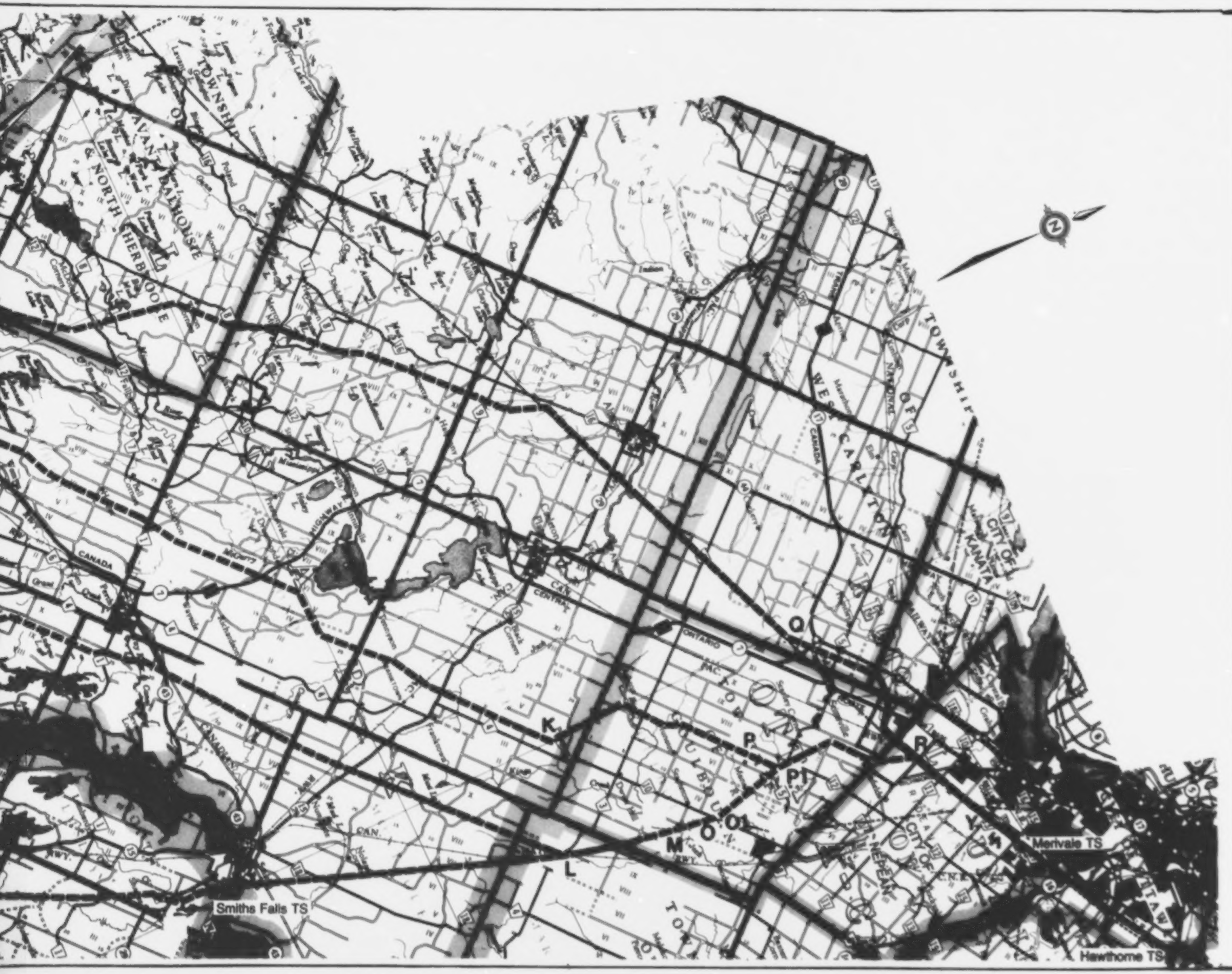

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Merivale TS
Smiths Falls TS
Hawthorne TS
TOWNSHIP OF WEST CARLETON
CITY OF KANATA
CITY OF NEPEAN

Figure 6.9
Alternative Routes in Final Comparison

Legend

Existing 500 kV line

Existing 230 kV Lines

Existing 115 kV Line

■ Transformer or Switching Station

▲ Generating Station

Alternative Routes

A Route Intersection

Alternatives routes and sites
are not drawn to scale
All boundaries are approximate

Scale 1 250,000

5 0 5 Miles

5 0 5 Kilometres

Eastern Ontario Study – West Section

Table 6.8

Cost and Length of Routes

ROUTE	ROUTE LENGTH	TRANSMISSION LINE LENGTH	CONSOLIDATION WITH EXISTING LINES		COMPARATIVE COST (MILLION $) 1984 NPW	POTENTIAL ADDITIONAL COST (MILLION $)
			1ST LINE	2nd LINE		
BLUE	151	302	13	39	101.2	8.0
RED	145	290	13	13	96.9	5.5
GREEN	145	290	13	13	95.6	5.8
YELLOW	139	278	5	48	93.8	5.5
BROWN ORANGE	217	290	38	65	107.1	8.6

*All routes lengths in kilometres

6.5.1.1 Blue Route (ABEFJQRY)

Land Use and Environment

A review of Table 6.7 shows that the Blue Route would have relatively high potential effects on eighteen different land use and environmental features identified by the data types; particularly from within the Appearance of the Landscape, Forest Resources, and Human Settlement factors.

Agricultural lands would be affected in Portland, Lanark, Ramsay, West Carleton and Goulbourn townships, and the City of Nepean. The 5.2 hectares of grain and forage crops that could be removed from production by tower bases would occur primarily on soils with a capability of classes 1-4. The majority of these would occur in Ramsay, West Carleton and Goulbourn townships. The 2.3 hectares of pasture that would be affected occurs generally on class 4 and 5 soils. In total, 28 km of land in agricultural production would be crossed along existing rights of way and an additional 6 km would be crossed by a new right of way.

The areas of primary agricultural concern were Portland, Ramsay, West Carleton and Goulbourn townships and the City of Nepean. In these areas many fields have been enlarged through the removal of hedgerows and have been tile drained. There is intensively cultivated land in grain and forage crops. The construction of additional towers would further impede machinery operation, and the lack of fence rows would increase the possible loss of productive land with in-field tower locations. Consolidation with existing facilities would result in only one additional set of towers for much of the route and would minimize the overall effects on the farms.

The concern in Lanark Township is for a new right of way that would cross about one kilometre of class 2 soils in grain and forage crops. The area lacks vegetated fence rows and would, thereby, have less potential for locating towers on fence rows.

Within Portland Township, the greatest effect on agriculture would occur east of Hartington, where the route crosses about 1.5 km of classes 1 and 4 soils in a grain-forage-pasture combination. The orientation of the field patterns would result in more than one tower per field. This would increase the degree of difficulty in maneuvering machinery around the towers, and would increase the amount of land lost from production. However, the presence of vegetated fence rows and small woodlots would provide an opportunity for some towers to be located off the worked fields.

The route would create numerous changes to the appearance of the landscape, with the greatest degree of change occurring between Sharbot Lake and Wolfe Grove. There are numerous crossings of major and dominant crests, and many minor crests are paralleled. About one third of the major crests are located in the northern end of Portland Township, on-Shield, but the significance of the skylining effects on these crests would be reduced somewhat by the presence of the existing 230 kV transmission lines. The remaining major crests occur primarily in the Sharbot Lake - Fall River area, and at the Bolton Creek crossing. The dominant crests are ridge farm landscapes which occur west of the Wolfe Grove in Lanark Township.

The Blue Route would also have a high visual effect on river valley landscapes at the Fall River, Bolton Creek and the western crossing of the Mississippi River. These landscapes would be altered by the differences in scale and character between the towers and the natural elements within these areas. The route would also contrast with the visual character of the rugged natural landscapes that may be considered scenic.

The route would be in the foreground of the viewsheds of Hartington, Watsons Corners, Rosetta, and Bridlewood. It would also be visible from Harrowsmith, Sharbot Lake, Almonte, Stittsville and Glencairn.

The Blue Route would affect a wide variety of biological resources. Between point A and the vicinity of Highway 7 in Oso Township, the areas of biological concern relate primarily to creek crossings. Millhaven, Wilton, and Bolton creeks are furbearer and waterfowl habitat. Millhaven and Fish creeks are warm water spawning systems. The route crosses the periphery of Cameron Swamp and the Mississippi River in proximity to a waterfowl breeding area.

The route would affect the edge of a heronry in Dalhousie Township and another east of Wolfe Grove. The potential effects on the heronry, however, related more to flight patterns than to habitat loss.

The route crosses the Manion Corners Long Swamp in West Carleton Township, but would not affect the sensitive/significant floral community contained within it. The route crosses a deer concentration area in West Carleton Township, but parallels the existing line through this area.

The route crosses the Stony Swamp adjacent to the existing right of way. The Stony Swamp is comprised of a complex of wetlands and forest associations which are recognized as locally important, and which are used for natural education and interpretive programmes. The potential effects on the swamp would be minimized by expanding the existing right of way.

The route also crosses numerous vegetated streams/rivers, such as the Long Sault, Middleville and Sheas creeks, and the Mississippi and Clyde rivers. Although all would be spanned, vegetation removal could indirectly affect the terrestrial and aquatic habitats. In total, 28 vegetated streams/rivers are crossed, of which the few mentioned are representative of those having high habitat value because of cover type diversity.

It is estimated that approximately 744 ha of forest resources would be cleared along the route. This includes parts of ten maple sugar bushes (16.0 ha), fifteen agreement forest areas (60.5 ha) and numerous highly productive upland hardwood forest areas. The productive upland hardwoods that would be affected are concentrated mostly in North Sherbrooke and South Sherbrooke and Dalhousie townships. The forests that would be affected along the existing line between Cataraqui TS and Bolton Creek are of lower significance because the soils along the right of way are shallow and there are numerous rock outcrops.

The paralleling of existing rights of way for much of the Blue Route would minimize the visual effects on historic communities in Portland, Lanark, Ramsay, West Carleton and Goulbourn townships and the City of Nepean. The new right of way in Lanark Township and Portland Township represents the only areas where major changes within almost 23,000 hectares of viewsheds of historic communities would occur. However, the route would require the removal of a limestone house (circa 1830) in Portland Township.

There would be no reported but unsubstantiated archaeological sites affected on this route. However, the route would affect about 18 ha high archaeological site potential. These sites are generally associated with water crossings, such as Bobs Lake, the Mississippi River and the Clyde River.

Ten permanent residences and 4 farms would have to be removed along this route. The majority of these occur adjacent to the existing lines through Portland, Hinchinbrooke and Bedford townships, with the remainder occurring along the existing 230 kV line through Ramsay and West Carleton townships. The route is in proximity to an additional 8 residences, 1 cottage and 20 farms. In the City of Kanata, the route utilizes the existing right of way which passes through the centre of the Bridlewood Subdivision. The route passes through an approved but undeveloped industrial subdivision at Highway 417 and Regional Road 5.

The Blue Route would create 87.5 km of diagonal right of way, with 55.8 km parallel to existing rights of way. The 60.5 km of new right of way runs parallel to the municipal survey fabric, except at the Mississippi River crossing east of McDonalds Corners.

About 295 properties would be directly affected by the route. Of this total, 188 properties would be affected by a diagonal right of way, while the remainder would be crossed on or parallel to the property fabric.

Fourteen townships and the Regional Municipality of Ottawa-Carleton would be affected. This represents 13 different official plans and 11 different zoning by-laws. The official plans for Kanata, Ernestown and South Fredericksburgh have no policies concerning utilities but their respective zoning by-laws make adequate provisions for Ontario Hydro. There is one potential problem area. The existing right of way crosses in proximity to an existing pit in Portland Township. The route crosses this pit, contrary to the Portland Township Official Plan.

The route would affect three pits and one quarry operation, and passes very close to the Godfrey Crystal Cave in Hinchinbrooke Township (a karst formation which is geologically unstable). It would also affect a relatively large area of high industrial mineral potential.

The route would affect a variety of recreational resources. The towers would be visible to cottagers on Hambly, Spring, Little Mud, McGuire, Howes, Bobs, Sharbot and Silver lakes. The route would also affect the periphery of the viewshed of Silver Lake Provincial Park, and crosses four canoe routes and five foot and cross-country ski trails. Three of the four canoe route crossings (Verona Lake, Fall River and Mississippi River - western crossing) are in natural landscapes where the lines would be out of character with the surrounding landscape. The Verona Lake crossing is of less significance because of the presence of the existing 230 kV lines. The foot and cross-country ski trails, although in a relatively natural landscape, are already adjacent to, or crossed by, the existing lines through the Stony Swamp.

Line Numbers

Socio-Economic and Public Involvement

Relative to ability to handle change, the townships along the Blue Route have the youngest population, experienced the fastest population growth rate in the period 1976 to 1983, and have the strongest orientation toward development. Slightly more than 60 percent of the affected townships encourage residential development.

With respect to compatibility with the community, the Blue Route has the largest rural farm population, a relatively small cottage population, an alternate lifestyle community and a large rural estate population.

In terms of economic base change, the Blue Route could result in the loss of agricultural sales as well as potential for loss of forest products and maple sugar sales.

Social/lifestyle change associated with the Blue Route would include significant access change because of the relative inaccessibility of the northern townships. The Blue Route could also create change to the character of communities along its length because of proximity to the 8 cottage communities, the crossing of The Farm, and proximity to the community near Union Hall.

The main public concerns raised were effects on:

- prime agricultural land in the Rosetta area and Portland Township;
- rural estates in Lanark and Ramsay townships;
- homes in West Carleton Township;
- the intentional community and organic farming of 'The Farm';
- woodlots in North Sherbrooke and Dalhousie townships;
- recreation area in Oso Township;
- homes and buildings in Portland Township;
- aesthetics; and
- property values.

Cost/Technical

The cost of the Blue Route would be $101.2 million ($7.4 million more than the least expensive). There would be a high potential for additional costs related to property acquisition due to potential purchases of homes and farms adjacent to the route and the installation of narrow base towers on cultivated land (Class 1 to 4). There would be poor access to the route which would increase construction and maintenance costs.

6.5.1.2 Red Route (ABEFJKPP$_1$RY)

Land Use and Environment

A review of Table 6.7 shows that the Red Route would have relatively high potential effects on nineteen of the land use and environmental features identified by the data types; particularly from within the Agricultural Resources, Biological Resources, Forest Resources and Heritage Resources factors. There would be limited potential effects on the appearance of the landscape, human settlements and recreational resources.

The Red Route would affect agricultural land in Portland, Bathurst, Drummond, Beckwith and Goulbourn townships and the cities of Kanata and Nepean. Excluding Portland Township and the City of Nepean, the route would create a new right of way across about 23 km of agricultural land parallels existing rights of way across 16 km. About 7.0 hectares of agricultural land in grain and forage crops having soil capability for agriculture classes 1-4 could be removed from production; primarily along the new right of way.

The effects in Portland Township would be identical to those described for the Blue Route. Bathurst and Goulbourn townships would be the most affected by the new right of way. These townships have large areas of intensively cultivated and tiled farm land. They would be affected primarily through the removal of treed fence rows and interference with machinery maneuverability around towers.

In Drummond and Beckwith townships, smaller areas of agricultural land would be affected and fewer towers would be required on agricultural lands.

The route also crosses intensively cultivated, high capability crop lands in the City of Kanata. However, this land is presently zoned for future residential development and will be taken out of agricultural production.

Within the City of Nepean, the effects on agricultural land would be minimized by consolidating the new lines with the existing lines across the Agriculture Canada Experimental Farm. This would be common to all alternative routes.

The potential effects on the appearance of the landscape would be the same for the Red and Blue Routes from Kingston Township to Sharbot Lake (point A to J). It would also be highly visible where it crosses through the viewsheds of Highway 7 (twice) and Highway 15/29. The route would also be highly visible to communities in parts of Bathurst and Goulbourn townships, and the cities of Kanata and Nepean.

The route is in the foreground of the viewsheds of Hartington, Drummond Centre, Franktown and Bridlewood. It would also be visible from Harrowsmith, Balderson, Prospect, Munster, Richmond, Fallowfield and Glencairn.

Between point A and J, the same 3 creeks as discussed under the Blue Route would be affected. From point J to Goulbourn Township the route crosses intermittent forested and wet terrain, interspersed with agricultural lands. Much of the forest land provides primary and secondary wildlife habitat.

The route crosses the McIntyre Creek, Black Creek and the Jock River at the south end of the Goodwood Marsh. The crossings would result in the removal of a diversity of cover types and would affect, to varying degrees, the ability of the areas to sustain wildlife communities.

The Red Route crosses the Blueberry Marsh for a distance of approximately 7 km. Although this portion of the marsh does not contain any areas of known biological significance, the route would create a major severance through a continuously forested wetland, with an associated loss of habitat.

The Prospect Bog, is a significant wetland complex containing diverse floral and faunal communities surrounded by a diversity of upland conifers and hardwoods. The clearing of vegetation for the route could affect these established floral communities.

The effects on the Stony Swamp would be the same as described for the Blue Route.

In total, 18 vegetated streams/rivers are crossed by this route.

The Red Route would affect 4 maple sugar bushes (2.8 ha), 13 agreement forest stands (31 ha), and numerous highly productive hardwood forest areas. The highly productive forest lands, which are comprised mostly of hard maple and red oak, are concentrated south of Highway 7 in the vicinity of Mississippi Lake. The total forest land potentially removed from production would be approximately 797 ha.

The Red Route is in the viewsheds of historic communities in Portland, Bathurst, Drummond, Beckwith and Goulbourn townships. With the exception of Portland Township, the route would require a new right of way to pass through a rural, farming landscape with numerous historic buildings (log and limestone construction). The majority of the viewsheds of historic communities (about 24,000 hectares) also occur in this area. The route would also require the removal of a limestone house (circa 1830) in Portland Township.

Three reported but unsubstantiated archaeological areas, with a total area of approximately 19 ha, would be affected by the route. About 84 ha of high archaeological site potential is crossed between Mississippi Lake and Ottawa.

This route would result in the removal of 7 permanent residences and 2 farms along the east side of the existing lines in Portland, Hinchinbrooke and Bedford townships. The Red Route is in proximity to an additional 11 residences, 1 cottage and 13 farms.

This route would create 67.2 km of right of way diagonal to the property fabric. Of this total, 25.5 km would parallel existing hydro lines through Portland, Hinchinbrooke, Bedford and Oso townships. The remaining 41.7 km would be new, diagonal right of way, occurring primarily through the townships of Drummond, Beckwith and Goulbourn.

The route crosses 430 properties. Of this total, 136 properties are crossed diagonally, and 216 are crossed on or parallel to the property fabric.

Fourteen townships and the Regional Municipality of Ottawa-Carleton would be affected, which represents 13 different official plans and 13 different zoning by-laws. The official plans for Kanata, Ernestown and South Fredericksburgh have no policies covering utilities but their respective zoning by-laws make adequate provision for Ontario Hydro. There are two potential problems areas. The route crosses hazard lands in Drummond Township, which is contrary to the Tay Valley Official Plan; and the route crosses an existing pit in Portland Township, which is contrary to the official plan.

The Red Route would affect 3 pits and a relatively large area of high aggregate resource potential, and passes near the Godfrey Crystal Cave. It avoids all areas of high industrial mineral reserve potential.

The Red Route avoids the Rideau Canal System and all public park lands except the Stony Swamp, which would be affected in the same manner as described for the Blue Route. It does however, pass within the viewshed of a private campground and crosses the southern edge of a private church campground (at McGowan Lake).

The route would be visible to cottagers on Hambly, Spring, Little Mud, McGuire, Howes, Bobs, and Mississippi lakes. It would also be visible to the same canoe route through the Venona area as described for the Blue Route.

Socio-Economic and Public Involvement

In terms of ability to handle change, townships along the Red Route have the oldest population, experienced the slowest population growth over the 1976 to 1981 period, and have one of the weakest orientations to residential development. Approximately half of the townships favour development and half favour the preservation of agricultural land.

With respect to compatability with the community, the Red Route has the smallest rural farm population but one of the largest cottage populations, as well as an alternate lifestyle community. It also has a small rural estate population. On the other hand, the Red Route has one of the largest percentages of commercial/industrial/business development of the five alternatives.

Relative to economic base change, the Red Route would experience slightly less potential loss than the Blue Route. Loss of agricultural sales and forest products and maple sugar sales and potential effects on municipal revenues would be intermediate among the routes.

Social/lifestyle changes associated with the Red Route could include increased access, especially in South Sherbrooke Township, where the road network is mainly north-south rather than east-west. Proximity of the lines to several cottage communities, Brooke Valley, and rural estate development in Beckwith Township could result in perceived impact on the rural and recreational experience associated with these communities and could potentially reduce enjoyment of their properties.

The main public concerns along this route were effects on:

- prime agricultural land in Drummond, Goulbourn and Portland townships;

- rural estates in Beckwith Township;

- the co-operative community in Brooke Valley;
- homes in South Sherbrooke Township;
- organic farming in Bathurst Township;
- recreation area in Oso and South Sherbrooke townships;
- homes and buildings in Portland Township;
- aesthetics;
- future development plans;
- property values.

Cost/Technical

The cost of the Red Route would be $96.9 million ($3.1 million more than least expensive). Potential for additional costs for property acquisition and narrow base tower installation on agricultural land would be equal to the Yellow Route and less than the other alternatives. Access for construction and maintenance would be the poorest. The CBC Shortwave Monitoring Station in Goulbourn Township may have to be relocated.

6.5.1.3 Green Route (ABEGLMOO_1P_1RY)

Land Use and Environment

A review of Table 6.7 shows that the Green Route would have relatively high potential effects on 11 of the land use and environmental features identified by the data types; but the effects would not be concentrated within any particular environmental factor except Mineral Resources.

Agricultural lands would be affected in Portland, Bedford, North Burgess, North Elmsley, Montague and Goulbourn townships and in the cities of Nepean and Kanata. Overall, the route crosses 19 km of agricultural land along existing lines and would result in 16 km of new right of way across farmed lands. The 5.8 hectares of land in grain and forage crops that could be removed from production occur primarily along the right of way in North Elmsley and Goulbourn townships. The pasture land that would be affected is dispersed throughout the route.

The effects in Portland Township would be the same as those described for the Blue and Red Routes. The route would result in the removal of treed fence rows and crossings of relatively small farm acreages in areas of intense cultivation in North Elmsley Township. The fence rows would provide opportunities for off-field tower locations, but some of these fields presently lack fence rows and are tile drained.

The agricultural land in Goulbourn Township is intensively cultivated in grain and forage crops and has a significant amount of tile drainage. Approximately half of the route through Goulbourn Township crosses perpendicular to property fabric, which would facilitate the location of tower bases on field boundaries. The lots are about 300 m wide and utilizing their edges would minimize interference with field operations. Agricultural lands within the townships of Montague, Bedford and North Burgess would be affected minimally as they are avoided or only periperally crossed. The majority of the lands crossed are pasture land.

The effects on agricultural lands in the cities of Kanata and Nepean would be the same as described for the Red Route.

The visual effects for the Green Route between point A and E would be the same as described for the Blue Route. The new route has minimal visual intrusions into viewsheds of settlements, scenic roads and long views or scenic vistas. Prominent skylining would occur in proximity to a number of homes and within the viewsheds of Burridge, Burridge Lake and the Barr Creek valley.

The route is in the foreground of the viewsheds of Hartington, Burridge and Bridlewood. It would also be visible from Harrowsmith, Stanleyville, Port Elmsley, Richmond, Fallowfield and Glencairn.

Between point A and E, the route would affect the same biological resources as described for the Blue Route. The route also crosses the wetland northwest of Richmond and the Stony Swamp. It could also affect a black spruce bog that abuts the eastern edge of the 115 kV right of way at the Rideau/Goulbourn township line. The potential effects on the bog would, however, be avoided by expanding the existing rights of way to the west.

In total 13 vegetated streams/rivers are crossed. The effects at the Milhaven and Wilton creek crossings would be the same as described for the Blue Route.

The Rideau Valley Conservation Authority (RVCA) wildlife management area, south of Perth, is crossed by the Green Route, but the right of way is sufficiently removed from the pond areas so that there would be no interference with the ascent or descent of the waterfowl. Thus, the transmission lines should have little adverse effect on the management area.

The Dwyer Hill Deer Yard is crossed by the Green Route. However, the deer yard is presently affected by the existing 115 kV line right of way. The proposed route would increase the right of way width by about 75 m along the edge of the deer yard. This would affect less than one percent of the total area.

Approximately 724 ha of forest cover would be removed. Five maple sugar bushes would be affected, with 8.9 ha removed. Fourteen forest management areas would also be affected (63.2 ha). Most of these management areas are young and the effects would be low. In general the productivity of the soil on-Shield is low because of its shallow and rocky nature.

The Green Route would affect the same heritage resources in Portland Township as described for the Blue Route. It is within the viewsheds of historic communities (consisting of log and limestone buildings) in Bedford, North Burgess, North Elmsley, Montague, Rideau and Goulbourn townships. The total area that would be visible from historic communities would be about 19,000 ha.

The Tay River and Canal, which is a component of the Rideau Canal, is crossed in a forested area where visibility would be reduced.

Five reported but unsubstantiated archaeological sites with a total area of about 27 ha would be affected. Most of these are located south of Perth. The route would also encompass 17 ha of high archaeological site potential, generally associated with major waterways and glacial features in the Ottawa area.

This route would directly affect 7 permanent residences and 1 farm adjacent to the existing lines in Portland Township. The route is in proximity to an additional 15 residences, 1 cottage and 16 farms.

This route would have 79.2 km of diagonal right of way, of which 28.4 km would parallel existing rights of way through Portland, Hinchinbrooke, Rideau and Goulbourn townships. The total amount of new right of way would be 101 km with 50.8 km of new diagonal right of way.

The route would affect 349 properties. Of this total, 169 properties would be affected by a diagonal right of way.

Fourteen townships and the Regional Municipality of Ottawa-Carleton would be affected. This represents 14 different official plans and 12 different zoning by-laws. The official plans for Kanata, Ernestown and South Fredericksburgh have no policies concerning utilities but their respective zoning by-laws provide adequate provisions for Ontario Hydro. There are two potential problem areas. The route crosses an existing pit in Lot 3, Concession 9, North Elmsley Township, which is contrary to the Central Rideau Official Plan. The route also crosses an existing pit in Portland Township, which is contrary to the official plan.

The Green Route would affect 5 pits and a relatively large area of aggregate reserve potential. There would also be a large area of high industrial mineral reserve potential affected, which is presently under investigation for future extraction.

The route crosses recreational sites and features in the Perth and Ottawa areas, but would not affect the associated recreational activities or facilities at these sites. The route crosses the Tay Canal and the Rideau Valley Conservation Authority property south of Perth. The visual character of the area would be altered slightly, but the Canal would not be directly affected and would be crossed at right angles near the Perth sewage lagoon. The Perth Wildlife Refuge, which provides interpretive facilities, is south of the route. The wildlife refuge has a viewing tower and a nature trail that is close to the route. However, the primary focus of viewing within the conservation area is away from the route alignment. The towers would not be visible from the nature trail because of the trail's forested nature. The effect on the Perth Wildlife refuge would, therefore, be only moderate.

Other than the Perth Wildlife Refuge, the Green Route would affect a canoe route at Verona, a private campground at Burridge Lake and the Stony Swamp. It crosses the viewsheds of Hambly, Spring, Little Mud, McGuire, Howes, Burridge, Wolfe, and Black lakes, but the overall effect would be relatively low.

Socio-Economic and Public Involvement

With respect to ability to handle change the population in the townships along the Green Route is relatively young. The population growth rate in the 1976 to 1981 period was slightly faster, and it had a stronger orientation to development than the Red Route. Approximately 60 percent of the townships along the Green Route favour development rather than the preservation of agricultural land.

Relative to compatibility with the community, The Green Route would affect one of the smallest rural farm populations but the largest cottage population and the largest rural estate population. There is an alternate lifestyle community associated with this route. The Green Route has one of the higher percentages of commercial/industrial/ business development among the routes.

Potential economic base changes would include losses of agricultural sales and forest products and maple sugar sales and potential losses to municipal revenues. The changes would, however, be relatively low.

Social/lifestyle changes associated with increased access along the Green Route would not be significant because of the existing network of roads through these townships. Proximity of the line to Burridge could detract from the recreational experience of the residents and visitors to Nature's Way and Burridge Lake. The proposed transmission line could also detract from the recreation experience of cottages along 9 cottage lakes.

The public concerns along this route were effects on:

- rural estates in Montague Township;
- views from Pike Lake, Black Lake, Otty Lake and Rideau Lake;
- recreational areas in Bedford, North Crosby and North Burgess townships;
- homes and buildings in Portland;
- homes and cottages in the Burridge area;
- prime agricultural land in Portland, North Burgess, North Elmsley and Goulbourn townships;
- aesthetics;
- property values.

Cost/Technical

The cost of the Green Route would be $95.6 million ($1.8 million more than least expensive). The potential additional costs for property acquisition and narrow base towers would be low since there is little agricultural land crossed where towers would be required in the middle of fields. Access for construction and maintenance would not present significant problems. The CBC Shortwave Monitoring Station in Goulbourn Township may have to be relocated.

6.5.1.4 Yellow Route (ABCDILMOO_1P_1RY)

Land Use and Environment

A review of Table 6.7 shows that the Yellow Route would have relatively high potential effects on six of the land use and environmental features identified by the data types; particularly from within the Appearance of the Landscape and Recreation Resources factors.

The Yellow Route would affect agricultural resources in Loughborough, South Crosby, Bastard, Kitley, Montague and Goulbourn townships, and in the cities of Kanata and Nepean. The route would result in 10 km of new right of way across agricultural land and 25 km parallel to existing rights of way. Approximately 5.6 ha of grain and forage crops, and 1.8 ha of pasture, would be removed from production along the length of the route. The majority of the tile drainage is located in the Ottawa area. These are the same areas as described for the Green Route.

One market gardening operation, with irrigation, would be affected along the existing 115 kV line in Bastard Township. The market garden is approximately 300 m wide at the crossing and could be spanned with single-circuit towers. When the existing line is consolidated with the second new circuit, a new tower may be built on the property.

The greatest overall effects on agricultural lands along this route would be due to the inconvenience of towers in fields reducing machinery maneuverability, and vegetation removal for right of way enlargement. However, the numerous small woodlots, pockets of untillable soils, and irregular field patterns would provide a variety of opportunities for non-agricultural tower locations. The use of existing rights of way and consolidation of facilities would lessen the physical changes to the farms because there would be only one additional line in the area.

There would be relatively little effect on the appearance of the landscape throughout the north half of the route, but there could be changes to the visual character of the Jones Falls area in South Crosby Township and, to a lesser extent, in the Loughborough Lake and Smiths Falls areas. The route parallels the existing 115 kV line and crosses the Rideau Canal in the vicinity of Jones Falls, north of the new highway bridge, in an area that is noted for its scenic beauty and its historic and recreational attractions. The changes to the appearance of the landscape would alter the scenic quality of the surrounding area and could affect the recreational experience of the Rideau Canal and associated facilities since the proposed facilities would be much larger in size than the existing 115 kV line.

Although consolidating the facilities in the Jones Falls area could mitigate the visual effects somewhat, the change in the visual character of the area would be related to the size of the towers coupled with the amount of right of way clearing required. Tower placements on crests and clearing to, or near, the shoreline would result in skylining of the towers from the upper locks at Jones Falls and the Rideau Canal.

The route also crosses the Rideau Canal at Smiths Falls. However, the existing line would be removed north of Smiths Falls TS and the new lines would cross the canal in an area that is relatively flat with a mix of rural, residential and industrial land uses. The degree of change to the appearance of the landscape at this location would be minimal.

In Storrington Township the route parallels a major crest between Loughborough and Lower Rock lakes. This alignment follows the crest for about 2.2 km through a rugged, treed landscape. The prominent position of the towers on the high ground would cause them to be visible from both lakes. The route also crosses a visual edge at the west end of Loughborough Lake.

The route is in the foreground of the viewsheds of Railton, Spaffordton, Elgin, Philipsville, Smiths Falls, and Bridlewood. It would also be visible from Jones Falls, Richmond, Fallowfield and Glencairn.

The sensitive or significant biological areas that would be affected along the Yellow Route include the Hutton Marsh, a black spruce bog at the Rideau-Goulbourn township line, the wetland northwest of Richmond and the Stony Swamp. The effects on the black spruce bog and the wetland at Richmond would be the same as those described for the Green Route. The effect on the Stony Swamp would be the same as described for the Blue Route. The Hutton Marsh and the Cooligan Marsh are crossed by the existing 115 kV line and the proposed right of way expansion would affect them further. The quality of these marshes are presently unknown, but they provide habitat for both waterfowl and small furbearers.

A small amount of waterfowl breeding and nesting area would be affected at Barretts Bay on Loughborough Lake. Barretts Bay is an extensive area of diverse vegetation with a variety of land forms. The integration of wetland vegetation, upland vegetation, and creeks makes this area ideal habitat for herons, waterfowl, furbearers and small game. The proposed right of way would affect primarily the upland portion of this habitat and would cross two creeks.

The route crosses continuously forested lands in Storrington Township which provide secondary wildlife habitat value.

The Yellow Route would affect the Dwyer Hill Deer Yard in the same manner as described for the Green Route.

All the 17 vegetated streams/rivers crossed by the Yellow Route would be spanned. None of these areas provide primary wildlife habitat.

There would be one maple sugar bush affected (0.9 ha) along the Yellow Route. Sixteen forest management areas (72.7 ha) would be affected. Some of these stands are very small and the trees are very young.

There are highly productive forest lands along the existing 115 kV line, but they have already been affected by the existing right of way. There are also good quality natural hardwood stands in the west half of Storrington Township. Approximately 600 ha of forest cover would be removed from production.

The Yellow Route would create a new right of way through Loughborough Township within the viewsheds of the historic communities of Railton and Spaffordton, where limestone buildings are the dominant heritage features. Goulbourn Township is crossed within the viewsheds of the historic community of Stapleton and a number of rural historic log and limestone buildings.

The principal heritage resource crossed is the Rideau Canal. Historic buildings associated with the lock stations would not be directly affected. The new towers would be visible from the upper lock at Jones Falls and Edmonds Lock at Smiths Falls. Specific visual problems are described in detail under the Appearance of the Landscape factor.

There would be no reported but unsubstantiated archaeological site affected by this route.

Potential effects on archaeological resources would be limited to the crossing of areas of high potential, which are generally associated with major waterways on-Shield and glacial features in the Ottawa area. The route encompasses 34 ha of high archaeological site potential.

The Yellow Route would require the removal of 5 permanent residences, 2 seasonal residences and 1 farm. These removals would occur along the existing 115 kV transmission line between Jones Falls and the southern end of Goulbourn Township. This route is in proximity to an additional 23 residences, 1 cottage and 7 farms.

The route would create 105.2 km of diagonal right of way, of which 37.5 km would be parallel to existing lines, from Jones Falls to Smiths Falls, and 29.8 km would be diagonal right of way replacing the existing 115 kV line from Smiths Falls TS to a point west of Richmond. The amount of new right of way required would be 54.1 km, with 37.9 km of this being diagonal to the property fabric.

The route crosses 369 properties with 252 of these being affected diagonally. Of this total, 184 are presently affected by existing transmission lines.

The Regional Municipality of Ottawa-Carleton, 15 townships and the Town of Smiths Falls would be affected. This represents 14 different official plans and 13 different zoning by-laws. The official plans for Kanata, Ernestown, and South Fredericksburgh have no policies concerning utilities, but their respective zoning by-laws make adequate provision for Ontario Hydro. The Yellow Route conforms with all official plans and zoning by-laws.

The Yellow Route crosses 2 small aggregate reserve areas along the 115 kV line and an area of high aggregate reserve potential in proximity to 1 pit in Goulbourn Township.

The effects on recreational resources would occur primarily in the southern half of the route. Much of the effect on recreation would correspond with the effects on the appearance of the landscape described earlier. Transmission towers would be visible to cottagers on Loughborough Lake and to boat or land based tourist traffic along the Rideau Canal System.

It is unlikely, however, that the visual changes would adversely affect the recreational uses of the facilities or reduce the tourist patterns in the area since neither the water or land based recreational facilities would be directly affected.

The route crosses the Hewlett-Packard (Canada) Ltd. recreational property in Storrington Township. The crossing should have no effect on the development as the route would be outside the viewshed of Elbow Lake; the planned recreational development will be on the lake's western shore. The road providing access to the property would be crossed, but the overall effect would be moderately low.

The route is within the viewsheds of Loughborough, Lower Rock, Crow, Troy and Sand lakes. It also crosses the Stony Swamp, as described previously.

Socio-Economic and Public Involvement

With respect to ability to handle change, the population along the Yellow Route is intermediate among the routes. However, this route has the least development orientation of the five alternative routes. An estimated 45 percent of the townships favour development as compared to 54 percent of the townships which favour preservation of agriculture.

Relative to compatibility with the community, the Yellow Route has one of the largest rural farm populations, the smallest cottage population, no known alternative lifestyle community, but some rural estate communities. It has one of the largest amounts of commercial/industrial/business development of the five alternative routes.

The economic base changes associated with the Yellow Route would involve potential losses of agricultural and forest products sales which are expected to be low relative to the other routes. Potential municipal revenue losses associated with the removal of houses, cottages, or farm buildings, similarly, are expected to be quite low.

The Yellow Route would parallel an existing transmission right of way for most of its length and would, therefore, be less intrusive than routes with longer, new rights of way. Transmission lines could also be viewed as undesirable in the natural, rural setting of the Loughborough Lake community.

The main concerns raised by the public were effects on:

- Rideau Canal System;
- prime agricultural land in Loughborough and Goulbourn townships;
- Loughborough Lake;
- recreational areas in Loughborough, Storrington, South Crosby and Bastard townships;
- biological resources in Loughborough and Storrington townships;
- Hewlett-Packard (Canada) Ltd. recreational property;
- water quality in Loughborough Township;
- aesthetics;

- future development;
- property values.

Cost/Technical

The cost of the Yellow Route would be $93.8 million (least expensive route). The potential additional costs for property acquisition and narrow base towers would also be the lowest of all the alternatives. Access would be poor in some areas of Storrington Township. The CBC Shortwave Monitoring Station in Goulbourn Township may have to be relocated.

6.5.1.5 Brown/Orange Route (ADI/ABEGHI - LMOO$_1$P$_1$RY)

Land Use and Environment

A review of Table 6.7 shows that the Brown/Orange Route would have relatively high potential effects on twenty-eight land use and environmental features identified by the data types; particularly from within the Appearance of the Landscape, Heritage Resources, Human Settlement and Recreation Resources factors. The potential effects on these four factors, however, would be strongly influenced by the separation of the route to follow two separate lines in the south half of the study area. The separation would result in the removal of a large number of homes and buildings in proximity to the existing lines, some of which are heritage resources. The longer line length would result in greater visibility to a large number of homes within the viewshed of the lines, and three crossings of the Rideau Canal at various points along the system.

The potential effects on agriculture along the Brown/Orange Route would be minimized by consolidating this route with existing lines for most of its length across agricultural lands. The effects associated with the new right of way would be higher in portions of Kingston and Goulbourn townships. The Brown/Orange Route crosses 63 km of agricultural land in total, of which 52 km parallels existing lines. Consolidation with existing lines, especially in Storrington, North Crosby, South Crosby and Bastard townships, would limit the amount of agricultural land lost in grain and forage crops to 6.1 ha. The same market gardening operation in Bastard Township would be affected, as described for the Yellow Route. Areas of tile drainage that would be affected are the same as described for the Yellow Route, plus an additional area of intensive cultivation in Storrington Township and a small area east of Newboro in South Crosby Township.

The effects on agricultural land between point A and I, where the new line would be consolidated with the existing line, would be minimal. There would be a few more towers because consolidation would result in shorter spans. However, there would be opportunities to utilize non-agricultural land for tower locations. Between Smiths Falls and Ottawa, the effects would be the same as those described for the Yellow Route. The main effects would be interference with machine maneuverability and the removal of treed fence rows.

The Brown/Orange Route crosses a large number of crests and visual edges; however, 68 percent of those crossed are adjacent to existing lines of comparable size. The effects would, therefore, be reduced somewhat because the presence of the existing lines has already altered the character of the landscape.

The main area of concern is at Jones Falls. New transmission lines at this crossing would contrast more with the existing landscape than at Newboro or Smiths Falls. At Jones Falls there would be skylining effects resulting from cresting and the removal of vegetation for one new line, but the effects would be minimized by maintaining as much of the compatible vegetation as is practical between the towers and the locks for screening purposes.

The effects at Jones Falls would be similar to those described for the Yellow Route, but would be less severe as only one new line would be built through the area. The effects at Smiths Falls would be the same for both the Yellow and Brown/Orange Routes. The effects at Newboro would be minimal as the new lines would be consolidated with the existing lines resulting in very little visual change.

The route would also be highly visible over a large area and to a large number of permanent residents particularly in the southern half of the study area. The route is in the foreground of the viewsheds of Elginburg, Mount Chesney, Sunbury, Elgin, Hartington, Newboro, Portland, Philipsville, Smiths Falls, and Bridlewood. It would also be visible from Shannons Corners, Glenburnie, Jones Falls, Harrowsmith, Fallowfield and Glencairn.

The Brown/Orange Route crosses several significant wetlands. Between point A and D, the Brown Route crosses the Collins Creek and associated floodplain. Although the floodplain provides extensive wetland habitat for waterfowl and furbearers, overall habitat loss may be minimized by retaining as much low growing compatible vegetation as practical.

At point D, the route is in proximity to a heronry located on the northwest corner of Traverse Lake, east of the 115 kV line. Since the route expands only to the west, there would be no effect on the heronry. North of point D, the effects for the Brown Route portion would be similar to those described for the Yellow Route.

Between point A and G, the effects on biological resources would be related to the crossings of the Millhaven and Wilton creeks and the Cameron Swamp (see Blue Route). Between point G and I, the route would affect approximately 81 ha of secondary wildlife habitat value. The only other area of any concern is the Stinson Swamp (a candidate International Biological Programme (IBP) site), which has a variety of vegetation associations and gradients. A small pond within this swamp abuts the south edge of the Ontario Hydro right of way. Consolidation on the north side would, however, avoid this area and cross the less sensitive outflow creek, which has marsh-like vegetation.
The potential effects on the Cooligan and Hutton marshes, the wetland northwest of Richmond and the Stony Swamp would be the same as described previously.

Approximately 566 ha of forest cover would have to be removed along the Brown/Orange Route. Six maple sugar bushes would be affected (2.2 ha). There are 25 forest management areas (75.5 ha) crossed. Most of these are already affected by existing lines. The highly productive forest lands that would be affected by this route are also distributed along the length of existing rights of way.

Splitting the lines in the south half of the study area would result in the new lines being visible over a large area (about 34,000 ha). The route would affect the viewsheds of historic communities between Glenvale, Mount Chesney and Battersea, and from rural farm landscapes with log and stone buildings adjacent to both existing rights of way.

The Brown/Orange Route would visually affect the Rideau Canal at Newboro, Jones Falls and Smiths Falls. It would also be visible from the upper lock station at Jones Falls and Edmonds Lock at Smiths Falls. It is near, but would not directly affect the recently discovered historic Rideau Canal construction camp site at Newboro.

One reported but unsubstantiated archaeological site would be affected beside the existing line near Battersea, with a total area of approximately 9 ha. The remainder of the 62 ha of archaeological site potential are associated with major waterways on-Shield and glacial features in the Ottawa area.

The Brown/Orange Route would result in the removal of 12 permanent residences, 2 seasonal residences and 3 farms. Approximately half of these removals would occur along the east side of the existing transmission lines through Portland Township and on the north side of the 230 kV lines between Newboro and Portland. The remainder would occur along the west side of the 115 kV line between Mount Chesney and the south end of Goulbourn Township. The route is in proximity to an additional 43 residences, 3 cottages and 25 farms.

The route would have 163.3 km of diagonal right of way, of which 138.2 km would be parallel to existing rights of way. The amount of new right of way required would be 46.2 km, with 25.1 km being diagonal right of way.

Five hundred and eighty-one properties are crossed, and 382 of these would be affected diagonally. Of the latter, 326 are presently affected by an existing right of way.

The Regional Municipality of Ottawa-Carleton, 17 townships and the Town of Smiths Falls would be affected. This represents 15 different official plans and 14 different zoning by-laws. The official plans for Kanata, Ernestown and South Fredericksburgh have no policies concerning utilities but their respective by-laws would provide adequate provisions for Ontario Hydro. There is one potential problem area. The route crosses an existing pit in Portland Township, which is contrary to the official plan.

This route would affect a relatively small area of high aggregate reserve potential, but would affect extensive areas of high industrial mineral reserve potential. These deposits are located in Storrington, South Crosby and Bastard townships. The existing lines have already sterilized a portion of these deposits. The route also passes very close to the Godfrey Crystal Cave in Hinchinbrooke Township.

The Brown/Orange Route would be visible from 2 lock stations at 3 crossings of the Rideau Canal System and would visually affect 3 parcels of property owned by Parks Canada. However, the visual effects of one additional line at Newboro and Jones Falls would be less than if both lines were to be put in either location. The effects at Smiths Falls would be the same as for the Yellow Route. The Brown/Orange Route would also be visible from Collins, Dog, Cranesnest, Traverse, Hambly, Spring, Little Mud, McGuire, Canoe, Newboro, Upper Rideau, Big Rideau, Troy and Sand lakes.

The Brown/Orange Route crosses 5 canoe routes, which include the 3 Rideau Canal crossings, and the Verona area described earlier.

Socio-Economic and Public Involvement

With respect to ability to handle change, the population of the townships along the Brown/Orange Route is slightly older. It experienced a faster growth rate in the 1976 to 1981 period, and had a strong development orientation. Slightly less than 60 percent of the townships along the Brown/Orange Route favour development; whereas, 40 percent favour the preservation of agricultural land.

In terms of compatibility with the community, there is a large rural farm population along the Brown/Orange Route, a relatively small cottage population, no alternate lifestyle population, and a small rural estate population. Further, the Brown/Orange Route parallels existing transmission lines for most of its length. This route also has the most commercial/industrial/business development of all five routes.

With respect to economic base changes, losses associated with the Brown/Orange Route would be intermediate. Due to the presence of an existing right of way, losses of agricultural sales and forest products and maple taps sales would be the least among the routes. However, because of the potential removal of a number of houses, cottages, and farm buildings the potential for municipal revenue losses would be relatively high.

In terms of social/lifestyle changes, increased access would not be a problem because this route parallels existing rights of way for almost its entire length. An additional transmission line along the Orange Route through Portland Township and the villages of Newboro and Portland could further alter the character of these communities and reduce the enjoyment of property. Along the Brown Route, a line could alter somewhat the character of the agricultural community in Mount Chesney and conflict somewhat with the recreational and historic community at Jones Falls.

As this route was developed by Ontario Hydro after the November, 1983, MPCs, public input was organized according to the Brown and Orange Routes.

Public concerns along the Brown Route were effects on:

- homes in Mount Chesney area;
- Rideau Canal System;
- prime agricultural land in Kingston and Goulbourn townships;
- recreational areas in Storrington, South Crosby and Bastard townships;
- aesthetics.

Public concerns along the Orange Route were effects on:

- homes and buildings in Newboro and Portland (hamlet);
- Rideau Canal System;
- recreational areas in Bedford, North Crosby, Bastard and South Crosby townships;
- homes and buildings in Portland Township;
- prime agricultural land in Portland and Goulbourn townships;
- aesthetics;
- private homes.

Cost/Technical

The cost of the Brown/Orange Route would be $107.1 million ($13.3 million more than the least expensive). The potential for additional costs associated with property acquisition and narrow base towers would be the greatest of all alternatives. The CBC Shortwave Monitoring Station in Goulbourn Township may have to be relocated.

6.5.2 Comparison of Alternative Routes

The five alternative routes were then compared to select a recommended route. First, the Blue, Red and Green Routes were compared because they involved extensive new rights of way and were alternative routes between point E and Y. Second, the Yellow and Brown/Orange Routes (from Section 6.4.2.3) were compared with the Green Route selected in the previous step.

6.5.2.1 Blue, Red and Green Route Comparison

This section outlines the significant aspects of the Blue, Red and Green Route comparison. The relative effects of each route are shown on Table 6.9.

Land Use and Environment

The Green Route would have the least overall potential effect on agricultural resources. This route crosses intermittent areas of agricultural land with numerous vegetated fence rows and woodlot edges which could be used to locate towers. The Blue Route follows existing rights of way across large areas of intensively cultivated land. There would be less potential for locating towers on fence rows, greater diagonal crossings of fields and more angle towers required. The Red Route would create a new right of way across more high capability agricultural land, resulting in a higher potential effect on the agricultural resources.

The Green Route would have slightly lower overall effect on the appearance of the landscape than the Red Route, and both would have lower effects than the Blue Route. The Green Route would have the least effect on natural landscapes crossed, on long views and scenic roads, and on the number of homes within sight of the towers, but would change the visual character of the Burridge area. Although towers would be highly visible in the northern end of Portland Township for all three route alternatives, the Blue Route crosses more major and dominant crests, mainly in the Sharbot Lake, Bolton Creek and Wolfe Grove areas. It would also affect a greater number of long views and viewsheds of scenic roads.

The Green Route would have the least overall effect on biological resources. All three route alternatives cross the Stony Swamp. However, the Green Route would have the least overall effect on sensitive/significant biological areas, areas having secondary upland wildlife habitat value, and the number of vegetated stream crossings, but greater effect on areas having primary upland wildlife/waterfowl habitat. The Blue and Red Routes would have greater overall effects on wildlife habitat value and the Red Route would have a much greater effect on wetlands.

The Green Route would have the least overall effect on forest resources. It would have relatively low effect on the high quality forest stands and on management areas. The Red Route would have the least effect on maple sugar bushes and upland hardwood stands, but would have the greatest total clearing requirements of forest land. The Blue Route would have the greatest effect on maple sugar bush operations and on high quality forest stands.

Although all three routes would require the removal of an historic limestone house in Portland Township, the Blue Route would have the least overall effect on heritage resources. This route follows existing rights of way for the longest length and since the existing lines are part of the landscape, the additional changes to the historic and

Table 6.9

Blue, Red and Green Route Comparison

Route	Agri- cultural Resources	Appearance of the Land- Scape	Biological Resources	Forest Resources	Heritage Resources	Human Settle- ment	Mineral Resources	Recreation Resources	Socio- Economic	Public Guide- lines	Cost/ Technical
Blue	2	3	2	3	1	3	2	3	3	1	3
Red	3	1	3	2	3	1	1	2	2	2	2
Green	1	1	1	1	2	1	3	1	1	3	1

1 - least effect
2 - moderate effect
3 - greatest effect

Line Numbers

representative landscapes would be proportionately lower. The Red and Green Routes would create new rights of way for long distances, much of which are within the viewsheds of historic communities. No known archaeological sites would be affected by any of these routes.

A number of residences and farms in Portland Township would be affected by all three routes. The Green Route would have slightly less overall effect on human settlement than the Red Route and both routes would have less effects than the Blue Route. The Green Route would affect one less farm, and would affect fewer properties than the Red Route. The Green Route would also create less disruption to existing land uses than the Red Route since much of the new right of way crosses remote or abandoned lands. The Blue Route would affect a greater number of residences and farms as well as a proposed industrial development in West Carleton Township.

The Red Route would have the least overall effect on mineral resources. It would have the least effect on existing pits and quarries and avoids all areas of high industrial mineral reserve potential. The Blue Route would affect more area of existing pits and quarries and industrial mineral potential. The Green Route would affect a greater number of pits, a greater area of high aggregate reserve potential, and a significantly greater area of industrial mineral potential.

The Green and Red Routes would have lower overall effects on recreation resources than the Blue Route. Although the Green Route crosses the Tay Canal and Rideau Valley Conservation Authority property, the recreational facilities or associated activities would only be affected marginally. The Red Route would have the least effect on the viewsheds of public park lands and canoe routes. The Blue Route would have a relatively high effect on the view from water dominated landscapes, with little potential to reduce this effect.

Socio-Economic and Public Involvement

The potential socio-economic effect of the Green Route would be lower with respect to economic base change and social/lifestyle change, intermediate in terms of ability to handle change but higher in terms of compatibility with its communities. The potential socio-economic effect of the Blue Route would be higher from the perspective of compatibility with its communities, economic base change, and social/lifestyle change. Potential socio-economic effect of the Red Route would be higher from the perspective of ability to handle change, economic base change, and social lifestyle change.

Since the Blue Route uses existing rights of way to the greatest extent, it would best adhere to the top rated public guideline. However, the Blue Route would affect more residences directly. The Red Route follows 10 km more of existing rights of way than the Green Route but, of the three, would have the greatest effect on natural areas and agriculture.

Cost/Technical

The Green and Red Routes would be less expensive than the Blue Route by $5.6 and $4.3 million respectively. The Blue Route is the only route which would not affect the CBC Shortwave Monitoring Station. The Red Route would have less potential effect on Bell Canada facilities than the Green Route.

Line
Numbers

Conclusion

The Green Route was preferred because it would have comparatively low effect on land use and environmental, socio-economic and cost/technical factors. The Green Route was then compared with the Yellow and Brown/Orange Routes.

6.5.2.2 Green, Yellow and Brown/Orange Route Comparison

This section outlines the significant aspects of the final route comparison among the Green, Yellow and Brown/Orange Routes. The relative preferences of each route are shown on Table 6.10.

Land Use and Environment

The Brown/Orange Route would have slightly lower overall effect on agricultural resources than the Yellow and Green Routes. By maximizing the consolidation with existing lines across agricultural lands, there would only be a few more towers required than are now present. Tower locations would, however, likely have to be changed due to the shorter spans associated with consolidated tower structures.

The Green and Yellow Routes cross less agricultural land, in total, than the Brown/Orange Route. While the amount of land potentially lost from production is small, the disruptions to farm operations due to multiple tower placements in fields would be higher.

The potential changes on the visual character of the built and natural landscapes are lower for the Green Route than for the Yellow or Brown/Orange Routes. The Green Route would have minimal visual intrusions into viewsheds of settlements, scenic roads, long views or scenic vistas, and water dominated landscapes. In particular, the Green Route avoids the multiple crossings of the Rideau Canal.

The Brown/Orange Route would have the least overall effects on biological resources. Most of the biological features along this route have been altered previously by the existing lines. Additional long term disturbances on these areas would be minimized by consolidating transmission facilities. However, there would be short term disturbances during construction.

The Brown/Orange Route would also have the least overall effect on forest resources since the right of way clearing requirements would be minimized by parallelling existing rights of way and consolidating transmission facilities. The Yellow Route would affect one small maple sugar bush, while both the Green and Brown/Orange Routes would affect six stands.

The Yellow Route would have the least overall effect on heritage resources. It would have lower effect on the viewsheds of historic communities, on areas of high archaeological site potential and on areas of reported but unsubstantiated archaeological sites than either the Green or the Brown/Orange Routes.

The Green and Yellow Routes would have less overall effects on human settlement than the Brown/Orange Route. The Green Route would have less effect on seasonal residential buildings, less diagonal right of way and fewer properties affected than the Yellow Route. The Yellow Route, however, would have less effect on permanent residences and farms than the Green Route and would minimize the effects of a diagonal right of way by following existing lines for a longer distance. It is also the only route alternative that

Table 6.10

Green, Yellow and Brown/Orange Comparison

Route	Agri- cultural Resources	Appearance of the Land- Scape	Biological Resources	Forest Resources	Heritage Resources	Human Settle- ment	Mineral Resources	Recreation Resources	Socio- Economic	Public Guide- lines	Cost/ Technical
Green	2	1	3	3	2	1	3	1	3	3	2
Yellow	2	3	2	2	1	1	1	3	1	2	1
Brown/ Orange	1	3	1	1	3	3	2	2	1	1	3

1 - least effect
2 - moderate effect
3 - greatest effect

would not contravene official plans or zoning by-laws. The Brown/Orange Route, on the other hand, would have the greatest effect on permanent, seasonal and farm buildings, the longest length of diagonal right of way, and the greatest number of properties affected.

The Yellow Route would have the least overall effect on mineral resources. It would have less effect on existing pits and quarries, on areas of high industrial mineral potential and on sensitive/unique geologic sites than the Brown/Orange and Green Routes. In particular, the Yellow Route avoids all areas of industrial mineral potential, while the other routes would affect large reserve areas.

The Green Route would have the least overall effect on recreation resources. It would have a lower effect on the viewsheds of the Rideau Canal System and associated lock stations, and on the viewsheds of private campgrounds, cottage lakes and canoe routes. The Green Route crosses the Tay Canal and the Rideau Valley Conservation Authority property, south of Perth, and a private campground at Burridge Lake. The Yellow and Brown/Orange Routes have multiple crossings of the Rideau Canal parallel to existing transmission lines.

Socio-Economic and Public Involvement

The Yellow and Brown/Orange Routes would have lower socio-economic effects especially with respect to ability to handle change, compatibility with the community, and social/lifestyle change. The Green Route would have a higher socio-economic effect, especially with respect to ability to handle change, compatibility with its communities, and social/lifestyle change.

The Brown/Orange Route best adheres to the public guidelines to follow existing rights of way. However, it would not minimize the effect on existing homes and buildings. The Yellow Route follows existing rights of way to a great extent and would minimize the effect on homes and buildings. The Green Route would create the longest new right of way which contravenes the public guideline to follow existing rights of way.

Cost/Technical

The Yellow Route is preferred from the economic perspective, and would cost $93.8 million. The Green Route would be marginally more expensive at $95.6 million. The Brown/Orange Route would be the most expensive, at $107.1 million, mainly due to increased length, and consolidation with existing lines. This route also would have the greatest possibility for increased costs.

Line Numbers

7.0 SELECTION OF RECOMMENDED ROUTE

7.1 Transmission Line Route

7.1.1 Selection Rationale

The results of the evaluation and comparison indicated that the Yellow Route would have relatively low potential effects on most land use and environmental and socio-economic factors and be the least expensive to construct. The major reasons for selection are as follows:

- generally lower effect on most environmental factors;
- follows existing rights of way as much as possible, while minimizing effect on human settlement;
- lower socio-economic effect;
- utilizes right of way between Smiths Falls and Richmond on which existing 115 kV line can be removed;
- adheres, for the most part, to public guidelines;
- least costly alternative;
- lower potential for additional property and narrow base tower costs;
- shortest route length.

Construction of any route would create some temporary positive effects such as increased employment and business activity in Eastern Ontario.

7.1.2 Description of the Recommended Route

The recommended route is illustrated on Figure 1.1 and is described as follows:

- Lennox GS to Point A
  - occupy the existing Ontario Hydro right of way for the entire distance (28.4 km)
- Point A to B
  - use existing right of way for 3.9 km
- Points B to C to D
  - acquire new property rights for two 500 kV lines for 35 km

- Points D to I to Smiths Falls TS
  - points D to I to Smiths Falls By-Pass - parallel the existing 115 kV line with the first 500 kV line. Remove the existing 115 kV line and consolidate with the second 500 kV line. Acquire new property rights including existing 31 m easement for a distance of 41 km;
  - Smiths Falls By-Pass IL1 - acquire new property rights for the two 500 kV lines for 3.5 km;
  - Smiths Falls By-Pass to Smiths Falls TS - parallel the existing 115 kV line with the first 500 kV line. Remove the existing 115 kV line and consolidate with the second 500 kV line. Acquire new property rights including existing 31 m easement for 1.5 km.
- Smiths Falls TS to Point O_1
  - remove the existing 115 kV line between Smiths Falls TS and Richmond DS and acquire rights for the two 500 kV lines including the existing 31 m easement for a total distance of 34.5 km.
- Point O_1 to R
  - acquire new property rights for 500 kV lines for 15.6 km.
- Point R to Y to Merivale TS to Hawthorne TS
  - remove existing lines and consolidate with both the 500 kV lines. Acquire property rights for new facilities between R and Y. The proposed lines can occupy Ontario Hydro owned land for most of the remainder of the route.

The total length of the recommended route from Lennox GS to Hawthorne TS is about 185 km.

Typical tower designs are shown schematically in Figure 7.1, 7.2, 7.3, 7.4 and 7.5. With the following exceptions, all suspension structures and angle structures would be conventional four footing lattice towers (Figure 7.1). It is proposed that the narrow base lattice towers (Figure 7.2) would be used for suspension structures located in open cultivated fields of prime farm land and specialty crops, in accordance with criteria established by Ontario Hydro and the Ontario Federation of Agriculture (see Section 7.1.3, Volume I). In areas of rugged terrain, V-guyed towers (Figure 7.3) would be used for suspension structures. In areas of consolidation with existing lines, special multi-voltage towers would be designed (Figure 7.4 and 7.5) to accommodate the specific conditions.

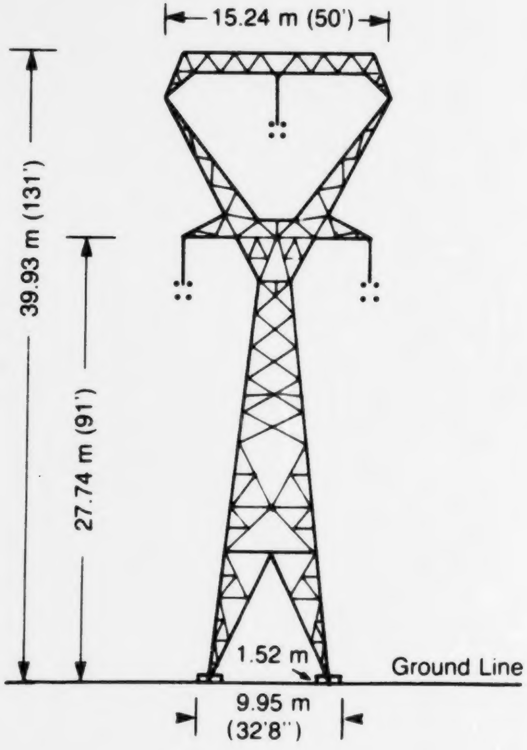

15.24 m (50')
39.93 m (131')
27.74 m (91')
1.52 m
Ground Line
9.95 m
(32'8")

Figure 7.1
500 kV Single Circuit
Conventional Lattice Tower

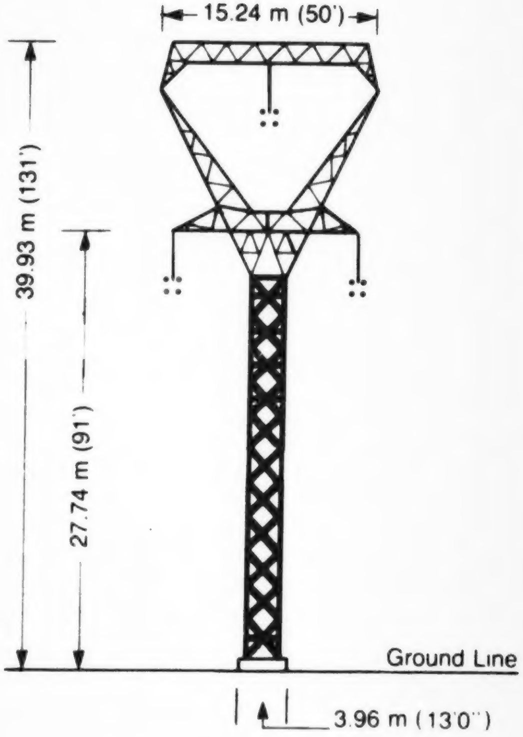

15.24 m (50')
39.93 m (131')
27.74 m (91')
Ground Line
3.96 m (13'0")

Figure 7.2
500 kV Single Circuit
Narrow Base Lattice Tower

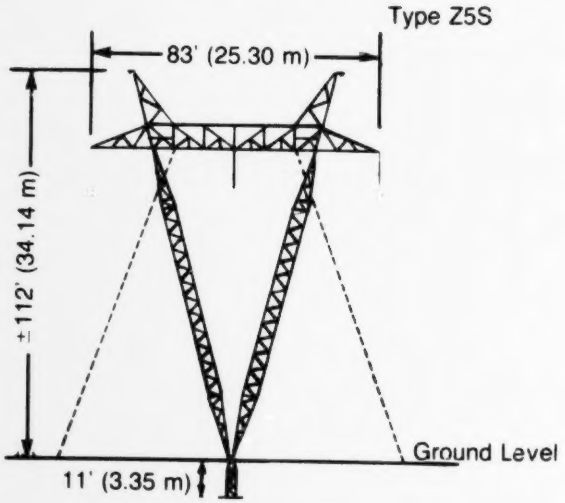

Type Z5S
83' (25.30 m)
± 112' (34.14 m)
Ground Level
11' (3.35 m)

Figure 7.3
500 kV Single Circuit
"V" Guyed Tower

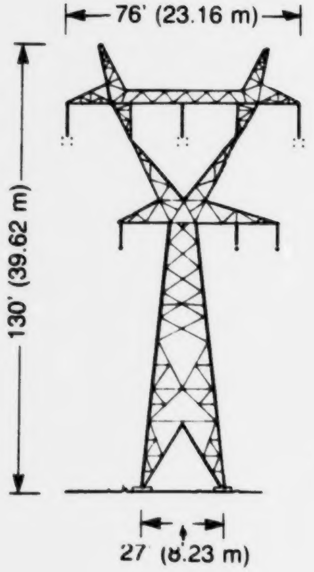

76' (23.16 m)
130' (39.62 m)
27' (8.23 m)

Figure 7.4
500 kV Single Circuit
230 kV Single Circuit Dual Voltage
Lattice Tower

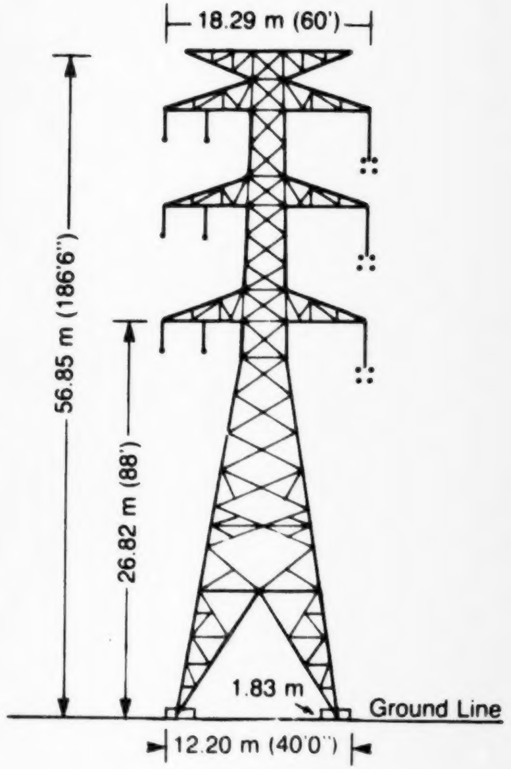

18.29 m (60')
56.85 m (186'6")
26.82 m (88')
1.83 m
Ground Line
12.20 m (40'0")

Figure 7.5
500 kV Single Circuit
230 kV Double Circuit Dual Voltage
Lattice Tower

Line Numbers

7.1.3 Summary of Potential Effects and Mitigation

Environmental changes or effects would result from the construction of 2 500 kV transmission lines on the recommended route. Ontario Hydro would endeavor to minimize the extent and duration of these effects through the application of appropriate mitigation, and restoration measures. These measures would be applied in accordance with Ontario Hydro's "Construction and Site Restoration Guidelines for Transmission Facilities, March 1981", approved by the Minister of the Environment. These include a broad range of mitigation, restoration and/or compensation measures which would be applied as necessary and appropriate.

Specific mitigation procedures would be developed in the course of final route design and tower placement. Initial areas for which mitigation measures are being considered include:

- Use of existing rights of way

  The recommended route follows existing rights of way from Lennox GS to Cataraqui TS (point B), from south of Jones Falls (point D) to west of Richmond (point O_1), and from point R east of the Bridlewood Subdivision to Hawthorne TS.

- Consolidation with existing transmission lines

  The recommended route includes the consolidation of an existing 115 kV line with the second 500 kV line from Jones Falls (north of point D) to Smiths Falls TS and existing 115 kV and 230 kV lines with the two 500 kV lines between point R and Hawthorne TS.

- Removal of existing transmission lines

  The 115 kV wood pole line from Smiths Falls to Richmond DS would be removed. The recommended route utilizes this right of way from Smiths Falls TS to point O_1.

- Installation of narrow base towers

  The number of narrow base towers which would be utilized on agricultural fields will be determined by applying the guidelines agreed to by the Ontario Federation of Agriculture (OFA) (Volume I, Section 7.1.3). The potential effects on agricultural operations would be reduced by the use of these towers.

- Installation of V-guyed towers

  Along the recommended route, V-guyed towers would be used in Loughborough, South Crosby and Storrington townships in rugged areas where access road construction would be difficult. These towers require a smaller concrete foundation and are suited to installation in Shield country. The use of these towers would minimize the potential effects of access road construction and foundation excavation.

- Loughborough Lake

  The route parallels Loughborough Lake and would be visible from portions of the lake. Ontario Hydro would work with the municipality and property owners to select tower locations and types to minimize the visual effects.

- Barretts Bay

  The recommended route would affect the upland portion of this habitat and would cross two creeks. Selective cutting would be practiced leaving as much compatible vegetation as practical.

- Perth Road crossing

  The route crosses the historic Perth Road at Missouri. Any existing compatible vegetation would be left where practical to provide screening of the new lines from the road.

- Hewlett-Packard (Canada) Ltd. recreational property

  Any existing compatible vegetation would be left where practical to provide screening of the new line from Hewlett-Packard's access road. The lines would not be visible from Elbow or Spectacle lakes around which the recreational development will be centred.

- Storrington Township

  Access roads that are off the right of way could be required to avoid sensitive areas.

- Jones Falls

  The new lines would not directly affect Jones Falls. However, they would utilize the existing right of way north of the new county road bridge and would be visible from the stone arch dam, the Lockmaster's House and the upper lock.

  A study is being undertaken to determine how best to minimize the effect on cottages and to reduce the visual effects of the lines from the Jones Falls area.

- Cooligan Creek and Hutton Marsh

  Construction during the winter months could minimize effects on the wetlands. Permanent access roads, with equalizing culverts, could be required during construction and for maintenance.

- Otter Creek

  The route was relocated to an area that would minimize the effect on existing homes and the creek. Access roads would be built to each side of the creek so that no crossing of the creek with construction equipment would be required.

Line Numbers

- Smiths Falls

Efforts would be made to minimize the visual effect of the lines from the lock stations, the canal and Highway 43. Further meetings could be required with Parks Canada to discuss their concerns.

- Smiths Falls to Richmond DS

The existing 115 kV wood pole line would be removed before the first 500 kV line is built. This would allow the new lines to be located in such a way as to minimize effects on human settlement throughout this section.

- Wetland northwest of Richmond

The wetland located northwest of Richmond is crossed by a 115 kV transmission line, a pipeline, a municipal ditch and a county road. Winter construction could be possible depending on the schedule of work.

- CBC Shortwave Monitoring Station

Further contacts will be made with CBC to determine the extent of the antennae relocation requirements.

- Stony Swamp

Mitigation will be discussed with the National Capital Commission.

- Agriculture Canada Experimental Farm

The existing lines would be consolidated the new lines to minimize the effects on the experimental farm.

- Rideau Canal crossing (Ottawa)

Efforts would be made to minimize the effect on the existing homes and the canal. Further discussions may be required with the directly affected property owners and the National Capital Commission.

- Noise

The construction, operation and maintenance of the transmission lines would be done in accordance with the 'Protocol for Community Noise Control'. Where municipal noise control by-laws are in place, these by-laws would be followed.

- Blasting

Ontario Hydro anticipates that no blasting would be done during construction of the transmission line.

Line
Numbers

7.2 Station Sites

The station sites selected as the terminal points for the transmission lines route for the west section study are existing Ontario Hydro facilities at Lennox GS near Bath and Hawthorne TS in the city of Ottawa.

At Lennox GS, all the new facilities required for the two 500 kV lines can be accommodated on the existing property.

At Hawthorne TS, all facilities required for the first two 500 kV lines can be accommodated on the existing site. Present plans call for expansion of the Hawthorne TS site across Ridge Road onto NCC owned property at the time of the third 500 kV line. This land is now vacant and has been reserved for Ontario Hydro by the NCC.

The only other station site affected by the west section study is Merivale TS, an Ontario Hydro facility in Nepean. The two 500 kV lines from Lennox GS would be routed through the switchyard. In addition, this station is the terminal for the 230 kV circuits from Hawthorne TS. No additional property is required at Merivale TS.

7.3 Public Review of Recommended Route

In May and June, 1984, the recommended route was presented to the public. A total of 24 municipal participation centres were held in the study area so that elected officials and their constituents could obtain more specific information about the recommended and alternative routes. Suggestions for modifications or relatively minor re-alignments to the routes were recorded and Ontario Hydro agreed to review these suggestions and present the results of the review to the Joint Board.

Attendance at MPCs along the recommended route was similar to past centres. Many property owners affected by the recommended route requested more information on property compensation policies, effects of the transmission lines and schedule of future activities. Several suggested re-alignments to the line to avoid existing or proposed development.

At the MPCs held in municipalities not affected by the recommended route, attendance was much lower than at past centres. The main concern raised related to the chance the recommended route would be rejected by the Joint Board.

The sixth Advisory Group meeting was held on June 9, 1984 and the recommended route was reviewed. The results of the MPCs were also reviewed.

8.0 POST APPROVAL ACTIVITIES

Following approval by the Joint Board, Ontario Hydro would proceed to refine the location and design of the transmission line and telecommunications sites and determine the specific methods of construction and mitigation. Consultation with directly affected parties would be carried out prior to preparation of final design plans and then property acquisition would be undertaken. After possession of the necessary property rights is obtained, construction would begin together with environmental monitoring.

The following sections describe the post-approval activities in more detail:

8.1 Transmission Line Route Finalization

A right of way plan would be prepared by Ontario Hydro from orthophotos with field surveyed ground control, at a scale of 1:4,000, showing the transmission line route. The precise location of the centre line would be defined taking into account any conditions of route approval set out in the decision of the Joint Board.

8.2 Information Centres for Affected Property Owners

After the right of way plan has been produced, Ontario Hydro would hold a series of information centres for affected property owners. At these centres, various Ontario Hydro personnel would be present, representing such areas as engineering, environment, real estate and construction, in order to answer questions the property owners might have, and to consider their concerns.

Following the centres, individual property owners would be personally contacted and advised of the process followed for acquiring property rights. In addition, the tower types and locations would be discussed and permission will be requested to enter their land for surveying, soil testing and property appraisal. At the request of affected property owners and subject to agreement of Ontario Hydro, minor adjustments could be made to the right of way plans at this time. Ontario Hydro would request the Joint Board to maintain authority to resolve any differences as to such adjustment.

Following the finalization of the right of way plan the project would be transferred within Ontario Hydro from the Route and Site Selection Division to the Transmission Systems Division, who would carry out final design and construction. Prior to beginning field activities, each owner would be given the name of the Ontario Hydro representative who would co-ordinate property owner contacts regarding surveys, property rights acquisition, soil testing, construction and restoration practices.

8.3 Final Design

The Transmission Systems Division would then prepare the final design plans. These plans would be based on additional site specific environmental and engineering data collected in the field, and through consultation with property owners, provincial ministries and land use permit holders. These design plans would identify the final tower locations and design, access roads and construction staging areas. The plans would also show specific areas for clearing and restoration of the right of way together with areas requiring special mitigation. Archaeological surveys and reports would be produced for those areas where high archaeological potential has been indicated.

Prior to construction the following documents would be filed with the Ministry of the Environment, both in the Public Record in its offices at 135 St. Clair Avenue West, Toronto, Ontario, and with the Director, Southeastern Region, Ministry of the Environment, 133 Dalton Street, Kingston, Ontario:

(i) Pre-Construction Access Route Plan

This is an engineering plan which would show the proposed location of each tower site and access road to be used for construction, forestry and maintenance activities. In addition, it would show any environmentally sensitive areas and specifies the special mitigation techniques which are planned.

(ii) Construction Schedule

This schedule would indicate when Ontario Hydro plans to carry out the major activities.

8.4 Property Acquisition and Compensation

The consolidated approval process adopted for this application incorporates the question of whether, under the Expropriations Act, the taking is fair, sound and reasonably necessary. If this undertaking is approved by the Joint Board, and subject to obtaining an Order-in-Council under the Power Corporations Act, Ontario Hydro would be required to expropriate all lands required for the facilities.

During the course of the completion of the final design plans, expropriation of the lands required would be completed by the registration, by Ontario Hydro, of a plan of expropriation under the Expropriation Act. In the circumstances of this application, the Joint Board is the approving authority.

Acquisition of all property rights required for the undertaking would be carried out in accordance with Ontario Hydro real estate acquisition policy. Only easement rights would be acquired for transmission line rights of way, except where an owner elects to sell Ontario Hydro the fee (full ownership) for the right of way and a severance would be acceptable to the municipality.

If, after a reasonable period of negotiation, an agreement cannot be reached, the assistance of a Board of Negotiation, appointed by the Lieutenant-Governor-in-Council, could be requested by either Ontario Hydro or the property owner. Its recommendation would not be binding and if an agreement still could not be reached, either party could ask the Ontario Municipal Board to arbitrate a settlement. The decision of the Ontario Municipal Board would be binding on both parties.

Any land purchased by Ontario Hydro which becomes surplus to its needs could be disposed of by sale. Certain potential purchasers such as the previous owner or government agencies would be given priority to acquire the surplus property, following which the property would be offered for public sale by public tender, public auction, through a real estate broker or by direct sale.

Line Numbers

8.5 Construction Activities

Construction of the transmission line would follow the 'Construction and Site Restoration Guidelines for Transmission Facilities, March, 1981', approved by the Minister of the Environment. These guidelines would be used by all personnel involved in the design, construction and maintenance of transmission lines in order that the work would be accomplished without causing undue adverse environmental changes. The guidelines would apply whether the work is carried out by Ontario Hydro or by contracted forces.

It would be mandatory that crew briefings on minimizing environmental damage take place prior to the commencement of field work. Environmentally sensitive areas would be managed according to the special mitigation measures outlined in the Construction Access Plan.

Contact would be maintained with the local MPs, MPPs, municipal officials, Advisory Group members and others on the study mailing list throughout the construction phase of the project by various means such as letters, status reports, announcements and field visits. News releases would be issued at significant stages to inform the local public of the project's status.

As construction proceeds, the plans filed with the Ministry of the Environment would be monitored closely. Due to many factors such as property owner preference, material supply delays, and weather conditions, the actual field construction could vary from the plan. The actual conditions which occur on site, and the deviations from the proposed mitigation measures, would be noted. Following completion of construction and the initial restoration phase of the right of way, any changes would be noted on the Construction Access Plan and this revised plan would be filed with the Regional Director and on the public record at the Ministry of the Environment as an 'as constructed' plan.

8.5.1 Planning and Specifications

Land surveys would be carried out to establish the limits of the right of way and to stake out tower locations.

Soil testing would be carried out at tower locations to provide input into the design of foundations.

Design and construction specifications would subsequently be developed for use in the preparation of the rights of way, and construction of the station and transmission facilities. These specifications would include information on:

- engineering detail;
- construction methods to be used in sensitive environmental areas; and
- selective cutting and restoration specifications.

8.5.2 Warehousing Yards

Temporary warehousing yards would be established every 30-50 km along the line and would be used to store construction materials and equipment, package material for delivery to tower sites, and assemble foundation reinforcing steel cages. Field office trailers or portable buildings would also be located at the yards.

8.5.3 Selective Cutting

Selective cutting would involve the removal of any tree(s) that could adversely effect the construction and safe operation of the transformer station and transmission line. The long-term goal would be to create and maintain a vegetative cover that is compatible with the overhead conductors and with the general operation of the transmission line.

Depending on the type, density and species of trees present, the clearing required through a wooded area on the right of way could be substantial (virtually clear cut) or minimal.

The landowner would have the option of retaining ownership of the felled wood or accepting payment for it. Marketable wood owned by Ontario Hydro would be sold by tender. Brush and non-marketable wood would be burned, chipped, left in brush piles or removed from the right of way.

Stumps could be sprayed as required to prevent sucker growth. Only government approved herbicides would be used and these would be applied under the direction of licensed supervisors.

8.5.4 Access Roads

Access roads would be required to enable vehicles, equipment and materials to reach the work sites along the right of way. They would be generally 4.6 m wide and capable of supporting the heavy equipment that would be used to deliver equipment and materials, construct tower foundations, assemble towers, and string the conductors. Mobility of the equipment, environmental factors, land use, cost, and owner preferences would all be taken into consideration when determining the location of the access roads.

Wherever possible, access roads would be kept within the right of way. On agricultural land, the preference would be to use existing farm lanes and field access roads (with the upgrading of such by spreading gravel and/or improving stream crossings where necessary). Farm gates would be installed in existing fences, and both the owner/lessee and Ontario Hydro would keep keys to any locked gates.

In wetlands, gravel or corduroy roads could be used. Equalizer culverts could also be installed to control the build-up of water behind such roads.

The type of crossings used for ditches and streams would be determined on a case-by-case basis depending on the size of the waterbody, the period of use, water flow, location of the right of way and other factors. The waterbody could be forded, culverts could be installed or crossing of the stream could be avoided all together depending on the environmental sensitivity.

8.5.5 Delivery of Materials

This would include the delivery of construction materials to the station site, to the temporary warehousing yards for storage and assembly, and to the individual work sites along the right of way.

Concrete would be delivered to individual tower sites by ready-mix trucks. Foundation reinforcing steel cages, prefabricated sections of tower steel, and tower hardware would be transported from the warehousing yards to the tower site via stake truck with self-loading cranes or by highway tractors and flat bed trailers. Transmission line conductor cables would also be delivered to the right of way by stake trucks or highway tractors and trailers. In wet ground conditions, a soft-track carrier with crane would be used to deliver materials to the work sites. Major electrical equipment, such as high voltage power transformers, would be transported by specially designed rail car and/or highway tractor with special heavy duty floats.

The use of existing municipal and regional roads would be discussed with the municipalities involved before specific delivery routes are determined.

8.5.6 Tower Foundations

In most cases, foundations required at each transmission tower location would consist of circular reinforced concrete structures up to 1.2 m in diameter and about 6.1 m deep. First a hole would be drilled into the ground to a specified depth and diameter using an augering machine. Then a pre-assembled reinforcing steel cage would be lowered into the hole, anchor bolts for the tower legs would be positioned, and the hole would be filled with concrete. On arable land, excess excavated soil would be removed from the site or located where the owner wishes. On non-arable land, the excavated soil would usually be spread around the tower site. If the augered hole fills with water during construction, a special clay (bentonite) would be pumped into the hole to stabilize the walls. If the walls of the hole are stable, the water could be pumped out of the hole and no bentonite used.

In bedrock areas, steel footings would be attached by drilling holes and grouting anchor bolts directly to the rock. No concrete foundations would be required. In wet areas and where poor soil conditions exist, specially designed foundations would be required that use screw anchors or piles driven deep into the ground.

8.5.7 Tower Assembly and Erection

After the foundation is completed, the tower would be assembled in sections on site. The tower would be bolted together using impact wrenches driven by a portable electric generator.

Using a small crane of up to 32 tonne capacity, the assembled sections would then be hoisted into position and bolted together. The upper portion of the tower would be erected using a larger crane of up to 114 tonne capacity.

A bulldozer would generally be required for ground leveling to ensure safe crane operation. Under unusual circumstances where the tower site would not be accessible by crane, towers could be erected using gin poles and helicopters. However, this method would be slow, weather dependent, and very costly compared to erection by crane.

8.5.8 Stringing of Conductor Cable

This would involve stringing the conductor cables out along the right of way and attaching them to the towers. The conductor cables for 500 kV transmission lines would be pulled under tension through travellers (pulleys) attached to each tower. Being under tension, the conductor cables would be kept off the ground at all times. This would avoid damage to the conductors and the right of way, the need to move heavy equipment along the full length of the right of way, and would allow for the selective cutting of the right of way.

The first step would be to use a helicopter to place an initial light pulling rope through the travellers suspended from each of the towers along the section of line to be strung. This rope would be then used to pull larger ropes and eventually the conductor cables through the travellers and into position.

Up to eight kilometres of line would be strung at a time. Special tensioning and puller equipment would be located in "set up areas" at either end of the section of line being strung. After the conductors are tightened to a specified tension, they would be clamped to each tower, then spacers and dampers would be installed. Rider poles would be installed at all road and rail crossings to prevent any interference with traffic.

8.5.9 Counterpoise

Counterpoise could be required at some locations. It would consist of burying galvanized iron wire on the right of way to reduce electrical ground resistance in areas of natural high electrical resistance (rocky or sandy areas). Low electrical ground resistance at tower locations would minimize the chance of operational line outages due to lightning.

A bulldozer with a slot-cutting plow would be used to bury the wire about 0.5 m into the ground. The wires could be buried along the right of way for the full length between towers or could extend a specified distance up and down the right of way from each tower.

8.5.10 Cleanup/Restoration

Cleanup/restoration would be the cleanup and rehabilitation of areas disturbed by construction activities.

A cleanup operation to remove surplus material and debris would follow each construction activity, and a final cleanup would be carried out when construction is completed.

Restoration could include replacing top soil, alleviating compaction, grading, grubbing, seeding, removal of temporary culverts and access roads and rip-rapping.

8.5.11 Project Schedule and Manpower Resources

i) Project Schedule

The first line between Lennox GS and Hawthrone TS is scheduled to be in-service by October 1989. In order to meet this in-service date, key activities have been scheduled as follows:

- submission of Environmental Assessment - August 1984;
- Order-in-Council, under the Power Corporation Act - October 1985;
- start of property acquisition - October 1985;
- start of construction - June 1987;
- in-service date - October 1989.

ii) Manpower Resources

An estimated 4,600 man-months would be required to build the first transmission line, install facilities at Lennox GS and Hawthorne TS and construct the microwave radio stations. This translates into a peak manpower requirement of about 380 workers over the construction period. The required construction skills would include: labourers, carpenters, operators, linesmen, groundmen and forestry tradesmen.

All construction workers would be members of trade unions and therefore, would be employed in accordance with union hiring practices. Linemen, electricians, and groundmen would be members of the International Brotherhood of Electrical Workers (IBEW) and would be hired from provincial Union Halls in Toronto. All other trades would enter collective bargaining jointly under the Ontario Allied Construction Trades Council with the Electrical Power Systems Construction Association (EPSCA) representing Ontario Hydro. These trades would be hired from local Union Halls in Kingston and Ottawa.

When the local union in the project area is notified of manpower requirements, the required workers would be supplied, to the extent possible, from out-of-work lists in the local area. If the local union is unable to fulfill the manpower requirements, then Ontario Hydro could employ union tradesmen from outside the area of the union local. Once these sources of skilled tradesmen are depleted, the EPSCA agreement would provide fcr contracting the international representative for the trade concerned.

Union tradesmen would then be supplied from outside the local area and will be hired from the nearest area in which they are available. If the union is unable to fulfill manpower requirements, then Ontario Hydro could hire non-union tradesmen and apprentices from the local area.

Some of the equipment and materials would be purchased in eastern Ontario. There would be potential for local contracts, particularly for forest cutting and provision of sand and gravel. The extent of local contracts would only be known at the pre-construction stage.

There would be no construction camps associated with construction of the transmission lines. Construction workers would commute from Kingston or Ottawa or take advantage of hotel/motel accommodation along the route. There would be adequate hotel/motel accommodation to accommodate the peak number of workers.

No additional maintenance personnel will be required.

8.6 Transmission Line Operation, Maintenance and Decommissioning

8.6.1 Right of Way Management

Right of way management activities would be undertaken to ensure that the transmission facilities on the right of way may be operated and maintained safely and reliably. It would include activities such as periodic tree cutting and pruning, selective herbicide application, inspection patrols, soil stabilization as necessary, and encouraging productive secondary uses of Ontario Hydro owned property.

One management objective would be to eliminate vegetation which is incompatible with transmission line operation and maintenance, and to encourage stable compatible vegetation. Vegetation control methods used to achieve this objective comply with government legislation, consider site specific conditions (i.e., surface and ground water) and would carried out by trained operators.

8.6.2 Line Maintenance

Routine visual inspections would be made of transmission lines so that corrective action could be taken before an operating problem developed (i.e., damaged insulators, tower members, hardware and conductors). In rural areas, helicopter patrols would be done about three times a year and a ground patrol once a year. Each line would be subjected to a climbing inspection by climbing 10 percent of the towers every 5-10 years.

Regular maintenance and emergency repairs would be carried out as required. Regular maintenance work could usually be scheduled well ahead of time and discussed with the land owners/lessees. In planning and executing regular or routine maintenance, a major consideration would be to limit the disruption to farm practices and the environment as much as possible. Where damage is unavoidable, restoration or compensation for the cost of restoration would be provided.

Emergency repairs would require immediate action to restore the facilities to service and the owners would later be compensated for any damage to the property or crops.

8.6.3 Secondary Uses

The granting of any new application for the secondary use(s) of right of way lands would be technically compatible with transmission facilities, meet public safety criteria and would be subject to the terms and conditions of Exemption Order OH-27, as outlined in the Procedural Document which was approved by the Minister of the Environment on April 6, 1983.

Secondary uses of lands occupied by Ontario Hydro would generally be granted where they do not conflict with adjacent owners, where they are compatible with the local community and do not interfere with Ontario Hydro's existing and projected uses of the right of way. These compatible uses include a continuance of the present use(s), agriculture, market gardening, garden plots, nurseries, industrial storage, utility pipelines, parks, recreation facilities and parking lots.

8.6.4 Decommissioning

Experience with similar types of transmission lines indicates that the service life would be at least 50 years.

Decommissioning these lines would involve either replacement or abandonment. If the lines are replaced or upgraded, the construction activities and associated environmental impacts would be less than those covered in this document. If the lines are abandoned, construction activities would be limited to the removal of the conductors and towers.

Access would be required to the tower locations, and following the removal of the towers, the foundations would be cut off below grade and covered. The affected areas would be restored to a standard set out in Section 2.8 of the "Construction and Site Restoration Guidelines for Transmission Facilities", March, 1981. Ontario Hydro would then consider disposal of owned right of way to adjacent owners if it is deemed surplus to future requirements.

Line Numbers

9.0 STUDY PROCESS - TELECOMMUNICATIONS

9.1 Overview

The recommended extension of Ontario Hydro's telecommunications system involves additional microwave radio as well as power line carrier (PLC) facilities. This section deals with the selection of sites for microwave radio stations. No additional property is required to upgrade the existing PLC system.

The existing microwave radio system ends at Hinchinbrooke SS, north of Kingston. It is proposed to extend the system from this point to Hawthorne TS in Ottawa. Repeater stations will be required to relay communications between these stations. The microwave facilities must be located on the station sites at Hinchinbrooke SS and Hawthorne TS due to technical requirements.

The telecommunications site study was co-ordinated with the schedule of the transmission line route study. The main steps in the study process to select recommended sites for microwave radio repeater stations between Hinchinbrooke SS, and Hawthorne TS were:

- identification of plans and study areas;
- data collection and rating;
- development of constraint maps;
- identification of alternative sites; and
- evaluation, comparison and selection of recommended sites.

(1) Identification of Plans and Study Areas

Two alternative telecommunication plans were developed. Plan I considered two microwave radio repeater stations while Plan II involved three microwave radio repeater stations between the terminal points. Study areas, within which alternative sites were to be located, were developed for each plan using a set of environmental and technical criteria (refer to Appendix D1).

(2) Data Collection and Rating

Environmental resource information from the transmission route data file was assembled and mapped at a scale of 1:50,000 for each of the study areas. The specific resourcos (or situations) that could be affected by the construction of a microwave radio station were rated into relative levels of high, medium or low environmental constraint. Areas of technical constraint were rated in a similar fashion.

(3) Development of Constraint Maps

The rated situations were used to develop a set of environmental and technical constraint maps for each study area, for the purpose of identifying alternative sites. These maps and other information on the study were displayed at the first round of MPCs for public review and input.

After further study, Plan I was eliminated mainly for technical and economic reasons and the Smiths Falls study area in Plan II was reduced to Smiths Falls TS. Plan I had no off-setting environmental advantages over Plan II (refer to Appendix D2).

(4) Identification of Alternative Sites

Criteria were developed for identifying alternative sites within the study areas in Plan II. Alternative sites were presented to the public at the second round of MPCs for their review and input.

(5) Evaluation, Comparison and Selection of Recommended Sites

The alternative sites were evaluated and compared based on environmental, technical and cost considerations and recommended sites were selected. The recommended sites were presented to the public at the 3rd round of MPCs for their comment.

9.2 Public Involvement

9.2.1 Objectives

The objectives of the public involvement programme for the telecommunications study were:

- to provide information to those potentially affected by or interested in the study; and

- to provide opportunities for these people to participate at key study steps.

9.2.2 Programme Design

The public involvement programme was co-ordinated with the transmission line route study. The primary vehicle for public input was the series of MPCs. While general information was available at all MPCs, a full range of information and maps were presented in those townships containing telecommunications study areas. Comment forms specific to the telecommunications sites were used during the second and third series of MPCs (refer to Appendix C2.3).

The programme also provided for direct contact with the property owners of the alternative sites and meetings as required with owners and local neighbours in proximity to the sites. Elected and appointed officials and the media were kept informed as the study progressed. A separate project mailing list was compiled to ensure information was received by those potentially affected by the telecommunications study. Information on the study was available at information kiosks at Ontario Hydro area offices in eastern Ontario.

10.0 TELECOMMUNICATIONS PLANS, STUDY AREAS AND CONSTRAINT MAP DEVELOPMENT

10.1 Alternative Plans and Study Areas

As the existing microwave radio system ends at Hinchinbrooke SS, it was necessary to identify sites for repeater stations between Hinchinbrooke SS and Hawthorne TS. Two plans were established between Hinchinbrooke SS and Hawthorne TS (see Figure 10.1). Plan I involves two repeater stations, one west of Perth and one east of Carleton Place with new terminal facilities at Hawthorne TS and Hinchinbrooke SS. Plan II involves three repeater stations, the first one north of Westport, the second near Smiths Falls, and the third between Carleton Place and Richmond with a terminal facility at Hawthorne TS.

For an explanation of how the two plans were developed and how the study areas were identified, refer to Appendix D1.

10.1.1 Selection of Plan II and Refinement of Study Areas

Technical, environmental and economic analyses were carried out on the study areas for both plans. Plan I was eliminated because it would require a new tower at Hinchinbrooke SS and higher towers for the two repeater stations resulting in increased construction costs and greater visual impact. Communications would be less reliable than in Plan II because of the greater distances between stations.

In Plan II, the South Elmsley/Montague study area was reduced to the limits of the existing transformer station site at Smiths Falls. These changes are detailed in Appendix D2.

10.2 Description of Study Areas

Plan II would require the identification of two repeater station sites on privately owned property with the third repeater station to be built at Smiths Falls TS. A terminal station would be built at the Hawthorne TS. Figure 10.2 illustrates Plan II and shows the study areas.

The first repeater station would be located in the North Crosby/South Sherbrooke study area. This station would relay signals between Hinchinbrooke SS and the Smiths Falls TS.

The repeater station located in the Beckwith/Goulbourn study area would relay signals between the Smiths Falls TS site and Hawthorne TS.

Prior to the identification of alternative sites within each of the study areas, a wide range of land use and environmental resource information was assembled in order to gain a better understanding of the concerns and siting opportunities present within each study area. For a description of the significant land use and environmental features of each study area, refer to Appendix D3.

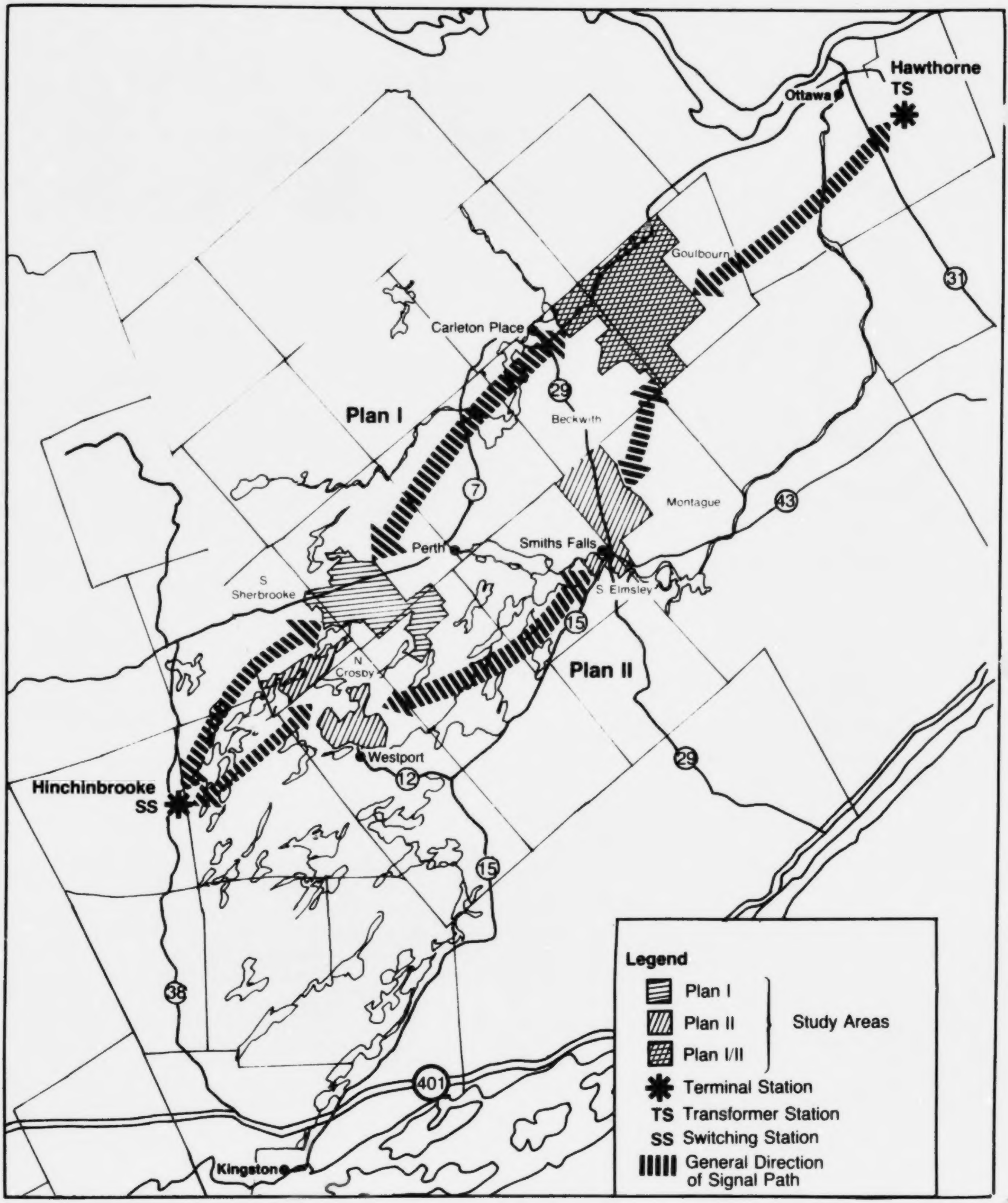
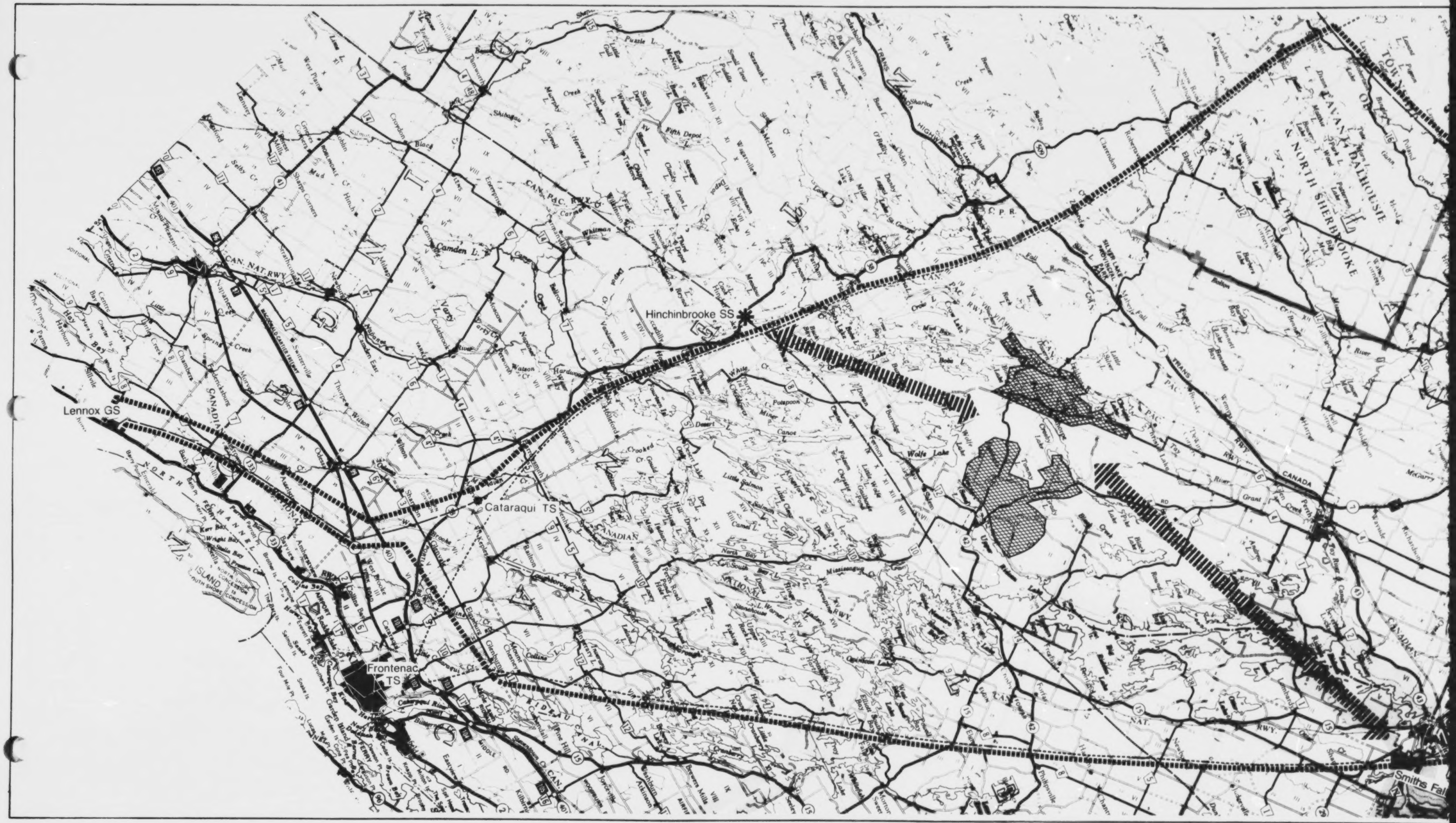
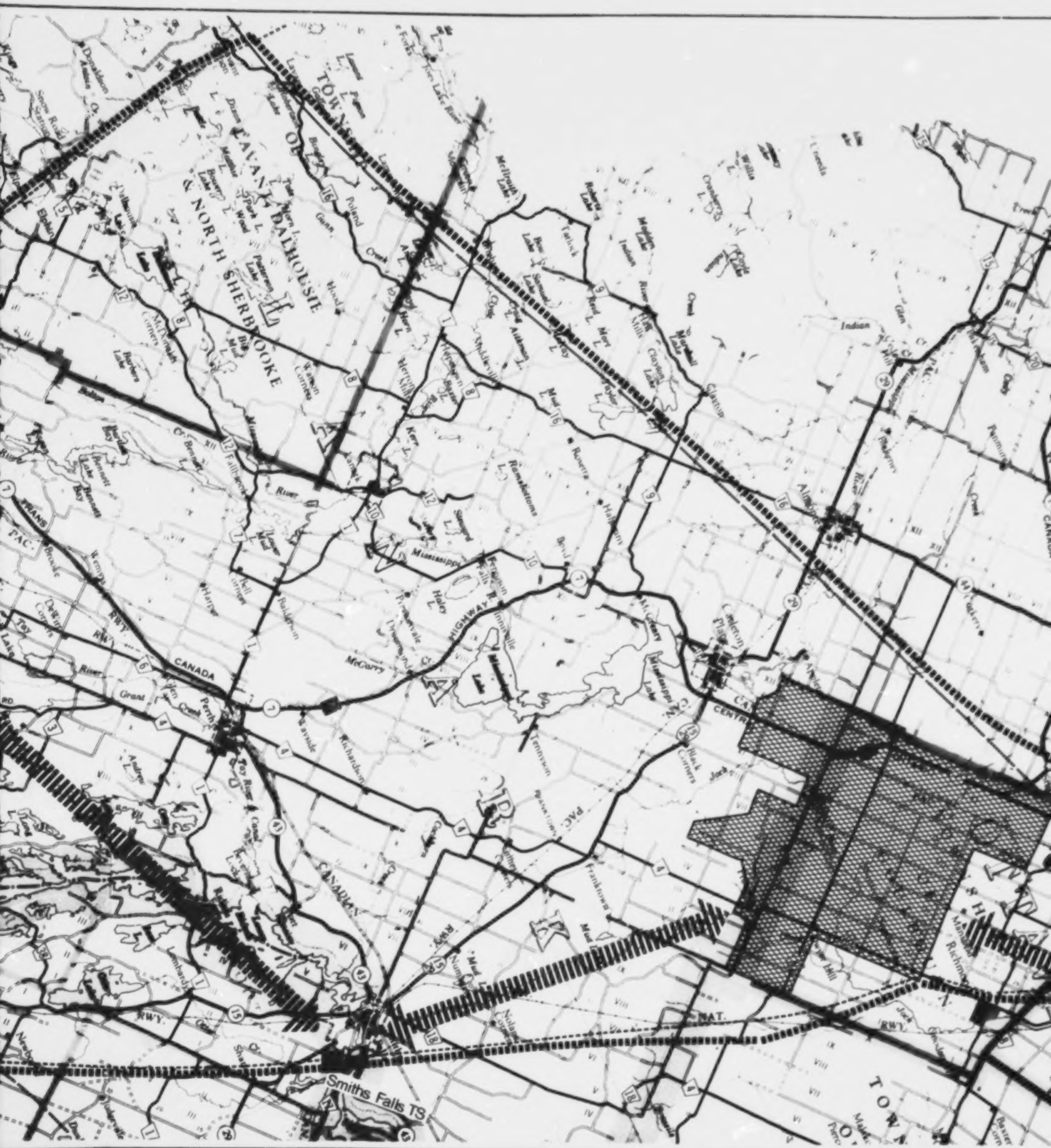

Hawthorne
TS
Ottawa
Goulbourn
31
Carleton Place
29
Beckwith
Plan I
7
Montague
43
Perth
Smiths Falls
S
Sherbrooke
S Elmsley
15
N
Crosby
Plan II
Westport
12
29
Hinchinbrooke
SS
15
38
401
Kingston
Legend
▤ Plan I
▨ Plan II
▦ Plan I/II
Study Areas
✱ Terminal Station
TS Transformer Station
SS Switching Station
IIIII General Direction of Signal Path

Figure 10.1
Alternative Telecommunications Plans and Study Areas


Hinchinbrooke SS
Lennox GS
Cataraqui TS
Frontenac TS
Smiths Fal


LAVANT, DALHOUSIE & NORTH SHERBROOKE
TOWNSHIP OF
Mississippi
HIGHWAY
CANADA
TRANS
PAC.
RWY.
NAT.
CENTRE
Perth
Carleton Place
Almonte
Clayton
Indian
Ferguson Falls
Innisville
Franktown
Black Corners
Richmond
Tay River
Grant Cr.
Smiths Falls TS

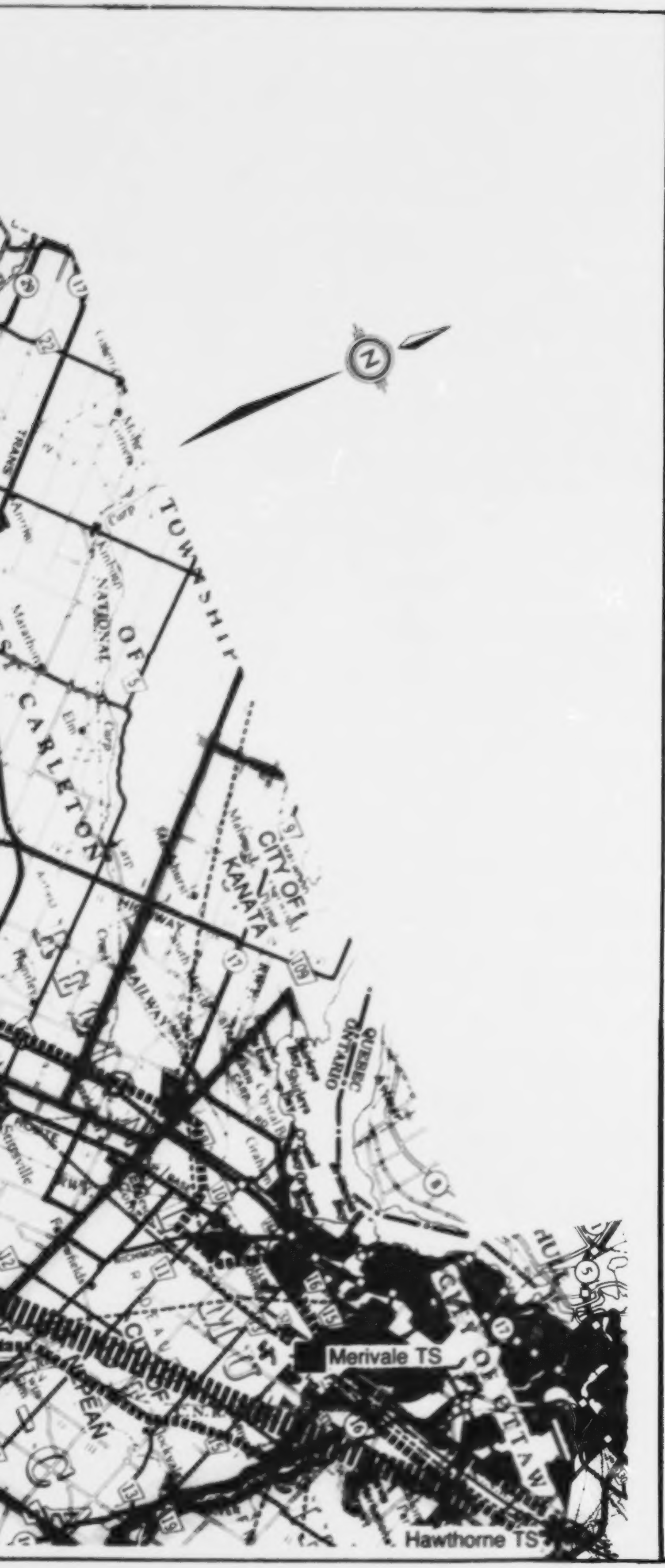

TOWNSHIP OF
WEST CARLETON
CITY OF KANATA
HIGHWAY
RAILWAY
QUEBEC
ONTARIO
HULL
CITY OF OTTAWA
NEPEAN
Merivale TS
Hawthorne TS
N

Figure 10.2
Plan II – Finalized Study Areas

Legend

——— ———	Existing 230 kV Line
-------------	Existing 115 kV Line
■,TS,SS	Transformer or Switching Station
✱	Terminal Station
▪▪▪▪▪▪▪▪▪▪▪▪	Eastern Route Study Area Boundary
▨	Telecommunications Study Area
◀‖‖‖‖‖▶	General Direction of Signal Path

Scale 1:250,000

5 0 5 Miles

5 0 5

Eastern Ontario Study
- Telecommunications

10.3 Constraint Maps

10.3.1 Development of Environmental Constraint Maps

Development of the environmental constraint maps for each study area began with the identification of environmental situations or resources that could be negatively affected by the construction and presence of a microwave radio station. The environmental situations selected fell within the same factor categories as in the transmission route study. The situations were rated into levels of high, medium and low environmental constraint. The ratings were based on the relative resource value and possible effects on each environmental resource. The environmental situations and their corresponding rated values are provided in Appendix D4. The rationale for the ratings is presented in Appendix D5.

The level of constraint identified within any given area represented the highest rated situation contained within that area. For example, if an area was rated high from a biological standpoint and medium from a mineral resources standpoint, the rating for that area would be high. Appendix D6 illustrates the environmental constraint areas associated with each of the environmental factor categories including a composite environmental constraint map.

10.3.2 Development of Technical Constraint Maps

Technical constraints were also identified and rated into high and medium levels.

The high level technical constraints that were mapped are:

- areas within 5 km of an airport; and
- areas more than 0.4 km from a year-round access road.

The medium level technical constraints that were mapped are areas within 3 km of a television or radio broadcast station.

Based on these ratings, a technical constraint map was produced for each study area as shown in Appendix D7.

10.3.3 Composite Environmental/Technical Constraint Maps

The next step involved combining the environmental and technical constraint areas to produce a composite environmental/technical constraint map. Again, the highest level of constraint occurring in any given area was used to represent that area.

Figures 10.3 and 10.4 show the composite environmental/technical constraint maps for each of the study areas in Plan II. In the areas of lower constraint, localized areas of high constraint such as permanent and seasonal residences, small natural undisturbed environments and viewsheds of residences and recreational areas could still exist. These localized constraints would be recognized during the site identification and selection stages of the study.

The constraint mapping technique employed in this study allowed for the concentration of alternative site identification in areas of relatively lower environmental and technical constraint.

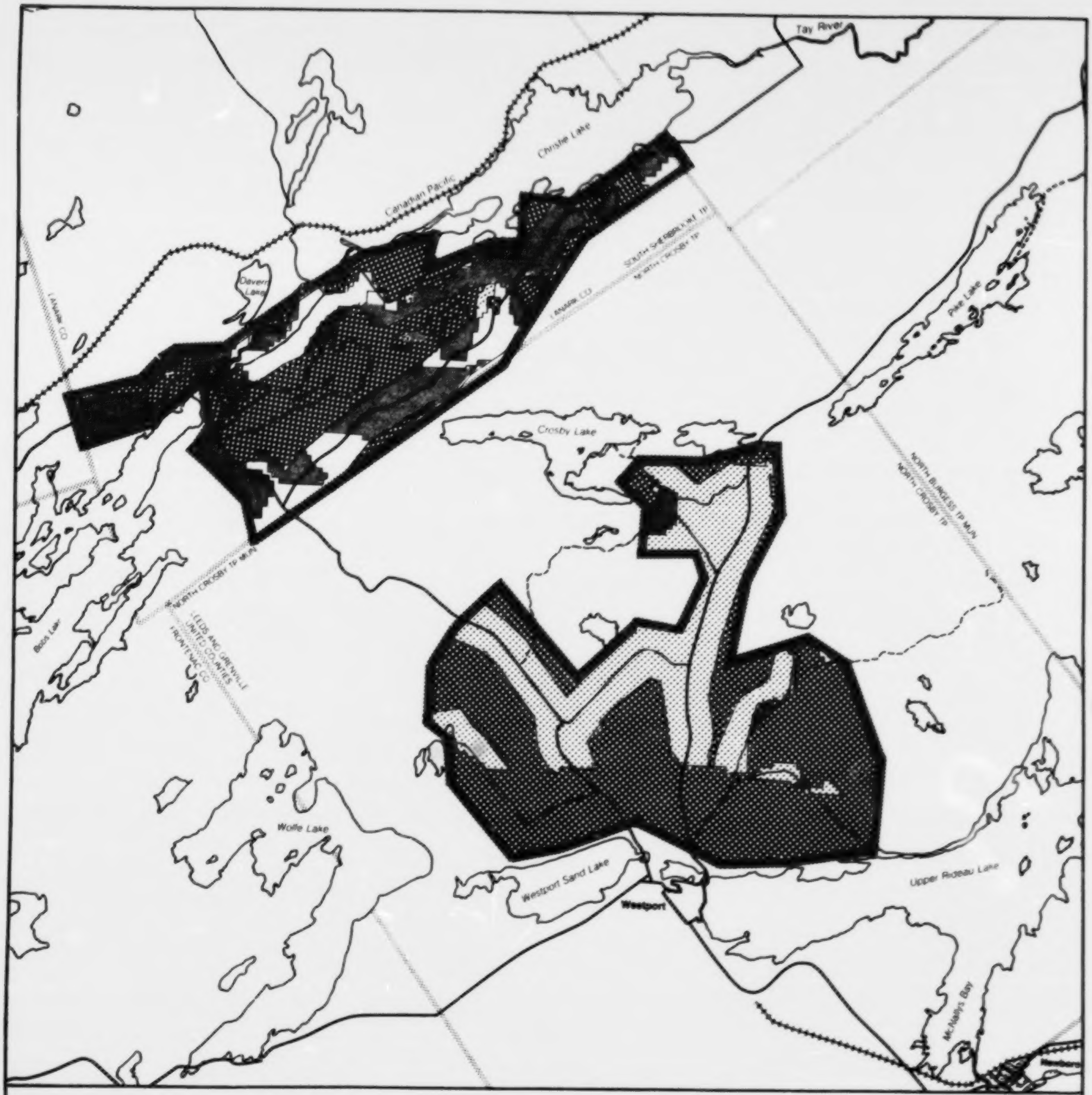

Tay River
Christie Lake
Canadian Pacific
Davern Lake
Lanark Co
South Sherbrooke TP
North Crosby TP
Lanark Co
Pike Lake
Crosby Lake
North Burgess TP MUN
North Crosby TP
North Crosby TP MUN
Leeds and Grenville United Counties
Frontenac Co
Bobs Lake
Wolfe Lake
Westport Sand Lake
Westport
Upper Rideau Lake
McNallys Bay

Figure 10.3 Eastern Ontario Study – Telecommunications North Crosby/South Sherbrooke Study Area

Composite Environmental/Technical Constraint Map

Legend

Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres

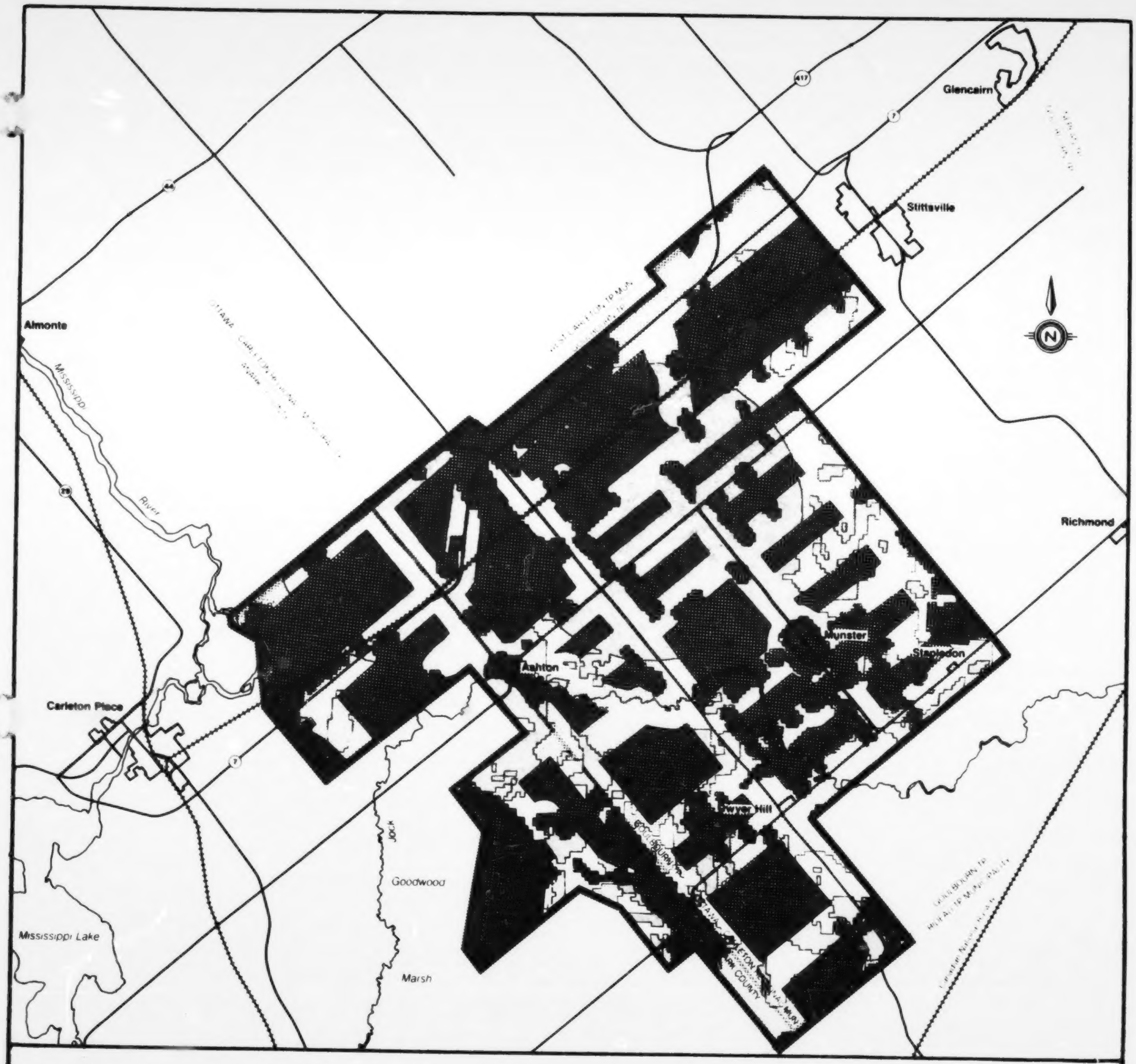
▮▮▮▮▮▮▮ Study Area Boundary

■ High Environmental and/or Technical Constraint Area

▨ Low Environmental Constraint Area

■ Medium Environmental Constraint Area

☐ No Known Environmental or Technical Constraint Area



417
Glencairn
7
44
Stittsville
Almonte
Mississippi
River
29
Richmond
Munster
Stapledon
Ashton
Carleton Place
7
Dwyer Hill
Jock
Goodwood
Mississippi Lake
Marsh
N

Figure 10.4 **Eastern Ontario Study – Telecommunications Goulbourn/Beckwith Study Area**

Composite Environmental/Technical Constraint Map

Legend:

▮▮▮▮▮▮▮ Study Area Boundary

■ High Environmental and/or Technical Constraint Area

■ Medium Environmental and/or Technical Constraint Area

▨ Low Environmental Constraint Area

☐ No Known Environmental or Technical Constraint Area

Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres

10.4 Public Review of Study Areas

The telcommunications study areas were reviewed by the Advisory Group on March 12, 1983.

The March 11, 1983 mailing for the first round of MPCs included Bulletin #1 on the Telecommunications Study which contained information on the background to the study and the study areas being considered.

At the MPCs, general information on the telecommunications study was available. In those townships where study areas for the microwave radio tower sites had been identified, more detailed information such as constraint maps and aerial photo-mosaics were available. Ontario Hydro staff were in attendance to answer questions and assist people with the maps and materials.

11.0 ALTERNATIVE TELECOMMUNICATIONS SITE DEVELOPMENT

Alternative sites were identified only in areas where alternatives would be technically and environmentally feasible. No alternative sites for microwave radio facilities were identified at Hinchinbrooke SS and Hawthorne TS for technical reasons. No alternatives to the Smiths Falls TS site were identified for the reasons listed in Appendix D2.

11.1 Site Step Data Collection

The composite environmental/technical constraint maps produced for the North Crosby/South Sherbrooke and Goulbourn/Beckwith study areas identified smaller areas where more detailed analysis would be carried out for identifying alternative microwave repeater stations sites. These are generally the areas of medium, low and no known constraint.

11.1.1 The Environment

The types of data collected to assist in the identification of alternative sites included the following:

- existing development
- land use
- forest cover
- soils
- topography
- property ownership
- municipal planning designations

For a list of the specific data types considered and their sources, refer to Appendix D8.

11.1.2 Technical

Technical information was collected and mapped within and in the vicinity of the telecommunications study areas, using the same process as described in Section 5.2.3. The same technical organizations were contacted and no specific concerns were expressed.

11.2 Location of Alternative Sites

After collection of the information related to the various data types, a set of site selection criteria were developed for the identification of alternative sites. These criteria were organized under four categories ranging from least desirable to most acceptable situations for locating a microwave radio repeater station. For a list of the criteria, refer to Table 11.1.

The nature of the site selection criteria are such that they can be applied through the use of (a) the composite constraint maps, (b) the additional detailed data collected, and (c) the results obtained from field observations.

Through application of the site selection criteria, a number of preliminary alternative sites were identified in each of the study areas.

Page 1 of 2

TABLE 11.1

SITE SELECTION AND REJECTION CRITERIA FOR THE EASTERN ONTARIO TELECOMMUNICATIONS STUDY

FACTORS	LEAST DESIRABLE SITUATIONS	RESTRICTED SITUATIONS	ACCEPTABLE SITUATIONS	MOST ACCEPTABLE SITUATIONS
Environmental				
Agricultural Resources	- farm buildings - cultivated lands for corn and monoculture - specialty crop lands	- mixed agricultural lands	- pasture lands - hay production lands - grazing lands	- abandoned agricultural lands
Biological Resources		- undisturbed natural environments - areas close to waterfowl habitats - areas close to heronries - coldwater stream crossings	- disturbed natural environments	
Forest Resources		- forested areas showing good production - forests containing merchantable timber	- low production forest land	- non-productive forest land

TABLE 11.1

SITE SELECTION AND REJECTION CRITERIA FOR THE EASTERN ONTARIO TELECOMMUNICATIONS STUDY

FACTORS	LEAST DESIRABLE SITUATIONS	RESTRICTED SITUATIONS	ACCEPTABLE SITUATIONS	MOST ACCEPTABLE SITUATIONS
Mineral Resources	- lands directly adjacent to quarry operations			- abandoned pits and quarries
Human Settlement	- homes and adjacent properties - other occupied buildings	- areas in full view of homes, cottages or proposed residential subdivisions	- areas that are relatively isolated from view of homes, cottages and proposed residential subdivisions	- areas that are completely isolated from view of homes, cottages and proposed residential subdivisions
Heritage Resources		- areas adjacent to designated heritage resource areas	- areas of archaeological potential provided that appropriate surveys and assessments are conducted and archaeologist's recommendations are adhered to	
Recreation Resources		- areas adjacent to or in full view of recreational areas	- areas that are relatively isolated from view of recreational areas	- areas that are completely isolated from view of recreational areas
Technical/Cost	- areas more than 1 mile from an electrical power supply - wetland areas	- areas of relatively lower elevation		- Ontario Hydro owned property - areas of relatively higher elevation - areas within 1/4 mile of a year round access road with an electrical power supply

The owners of these sites were identified through the 1982 Ministry of Revenue assessment rolls. They were contacted by telephone or in person to discuss the study and their comments assisted in refining the alternative sites. The final set of alternative sites for the North Crosby/South Sherbrooke and Goulbourn/Beckwith areas are shown in Figures 11.1 and 11.2 respectively. Eight alternative sites were identified north of Westport (6 in North Crosby Township and 2 in South Sherbrooke Township). Four alternative sites were identified in Goulbourn Township and 2 in Beckwith Township. The repeater station site identified at the Smiths Falls TS and the terminal station site at Hawthorne TS are shown in Figures 11.3 and 11.4.

11.3 Public Review of Alternative Sites

Those people owning property within approximately 1.6 km of any of the alternative sites were identified from Ministry of Revenue property assessment maps and assessment rolls (1982) and their names were added to the project mailing list.

In October of 1983, site owners, neighbours and other interested residents on the project mailing list were mailed Bulletin No. 3, and a letter inviting them to attend the MPC in their area to examine detailed maps and discuss the project with Ontario Hydro. The Bulletin contained information that updated the study and a map of the locations of the alternative sites.

At all of the 24 MPCs, general information on the telecommunication study was available. In those four townships (North Crosby, South Sherbrooke, Beckwith and Goulbourn) where alternative sites for the microwave radio towers had been identified, more detailed background information on the sites including constraint maps and aerial mosaics was available. The detailed information was also made available at the appropriate centres for Smiths Falls and Hawthorne TSs.

A comment form specific to the telecommunications study (refer to Appendix C2.3) was developed to assist in documentation of specific site related comments. Eight telecommunication comment forms were completed by those potentially affected by the study. General comments related to:

- aesthetics
- property devaluation
- electrical effects
- project need

Alternative transmission line routes are found in proximity to alternative sites in the North Crosby/South Sherbrooke and Goulbourn/Beckwith study areas. Route comment forms completed by residents of these areas were also reviewed to gain a perspective on their concerns. Generally concerns centred on aesthetics, loss of recreational enjoyment, loss of woodlots, property devaluation, use of herbicides, effect on wildlife, and effect on radio and TV reception.

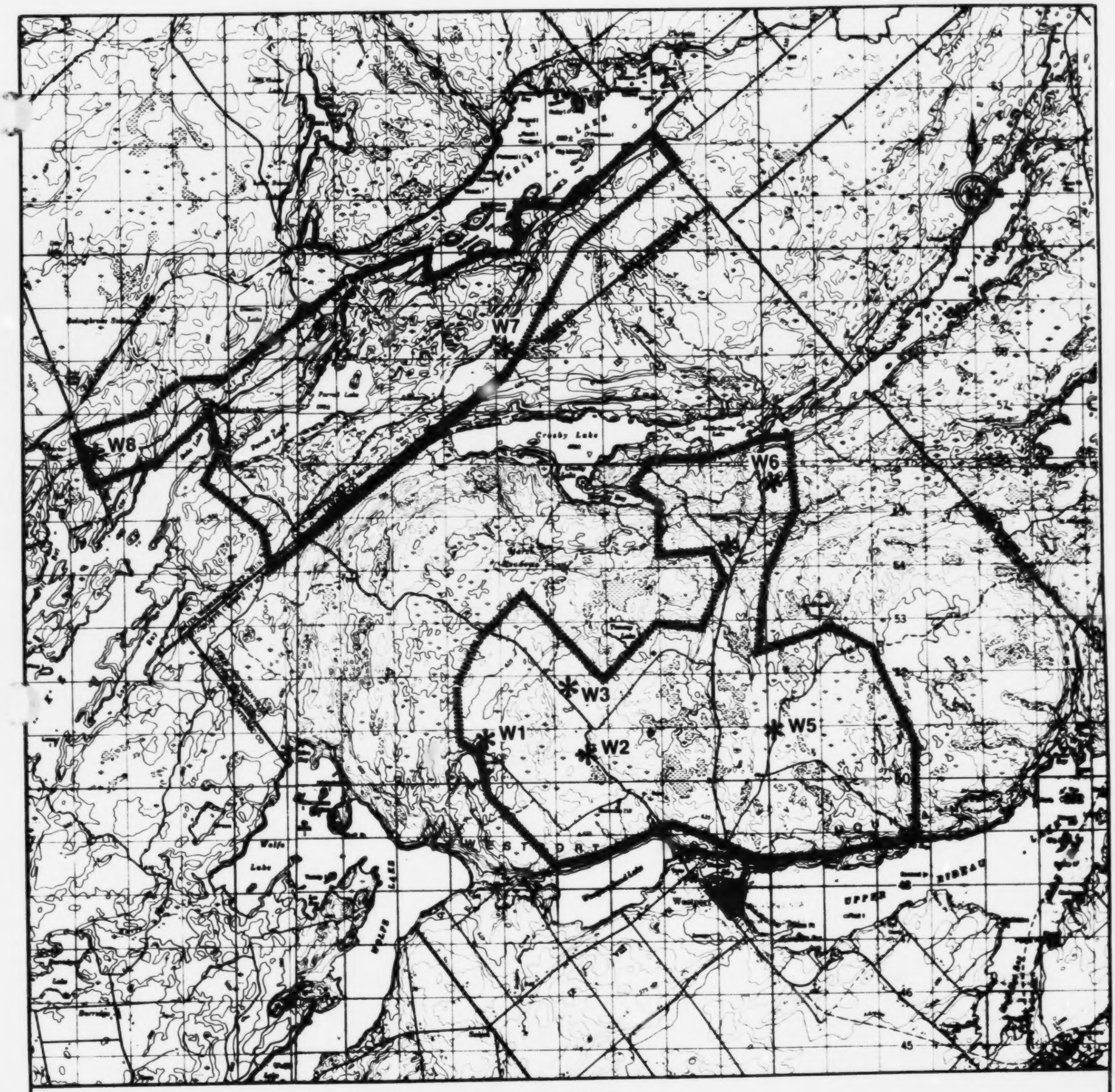

W1
W2
W3
W5
W6
W7
W8
Crosby Lake
WESTPORT
UPPER RIDEAU
53
52
45
46
48

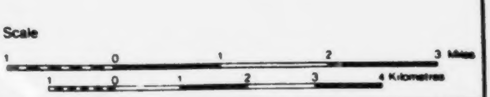
Figure 11.1 Eastern Ontario Study – Telecommunication
North Crosby/South Sherbrooke Study Area

Alternative Microwave Radio Repeater Station Sites

Legend

▮▮▮▮▮▮▮ Study Area Boundary

✱ Alternative Site


Scale
1
0
1
2
3 Miles
1
0
1
2
3
4 Kilometres

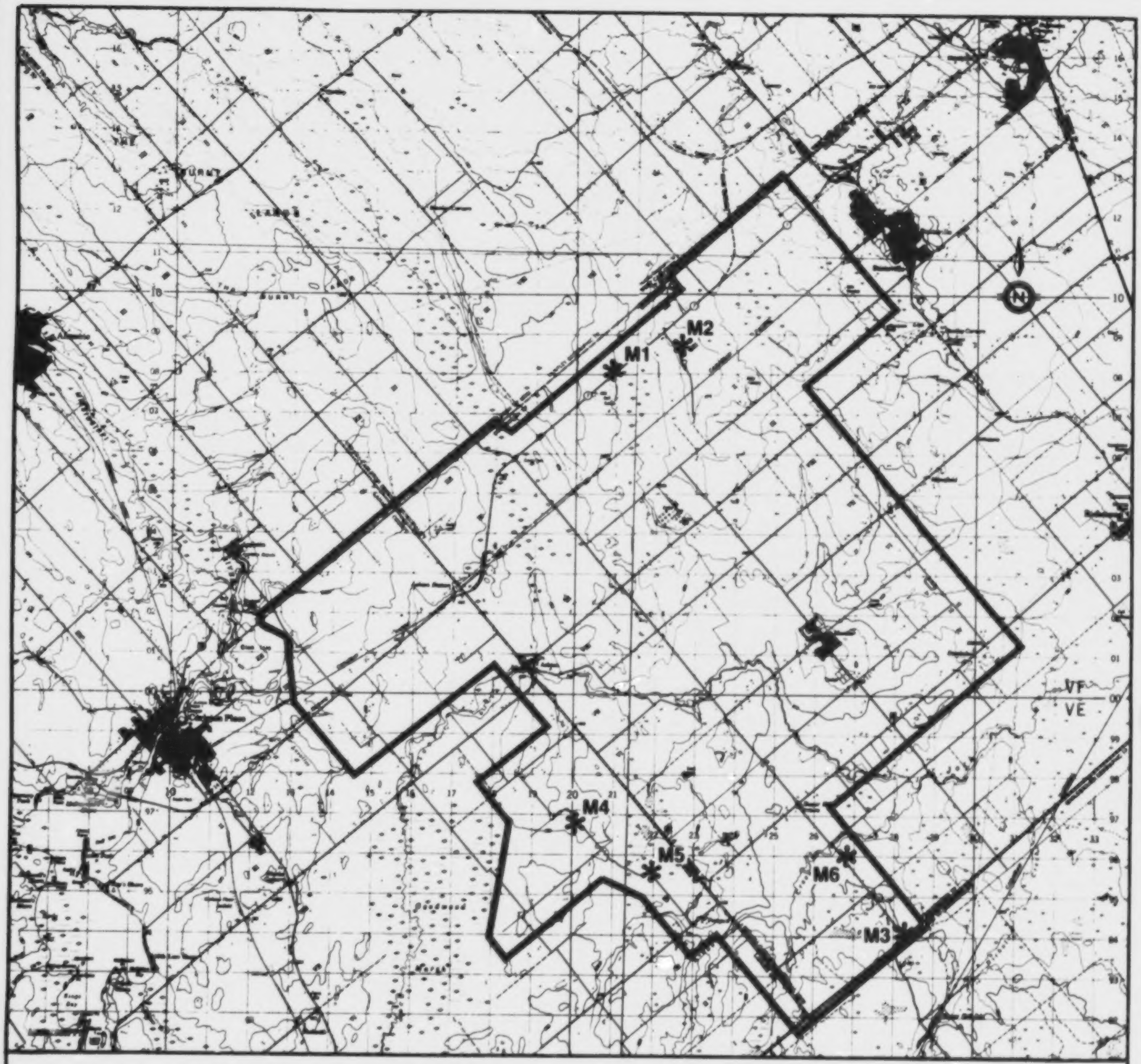

M1
M2
M3
M4
M5
M6
VF
VE
Scale
1 0 1 2 3 Miles
1 0 1 2 3 4 Kilometres

Figure 11.2 **Eastern Ontario Study – Telecommunications Goulbourn/Beckwith Study Area**

Alternative Microwave Radio Repeater Station Sites

Legend:

▮▮▮▮▮▮▮▮ Study Area Boundary

✱ Alternative Site

Figure 11.3 - Eastern Ontario Study – Telecommunications Recommended Site at Smiths Falls TS

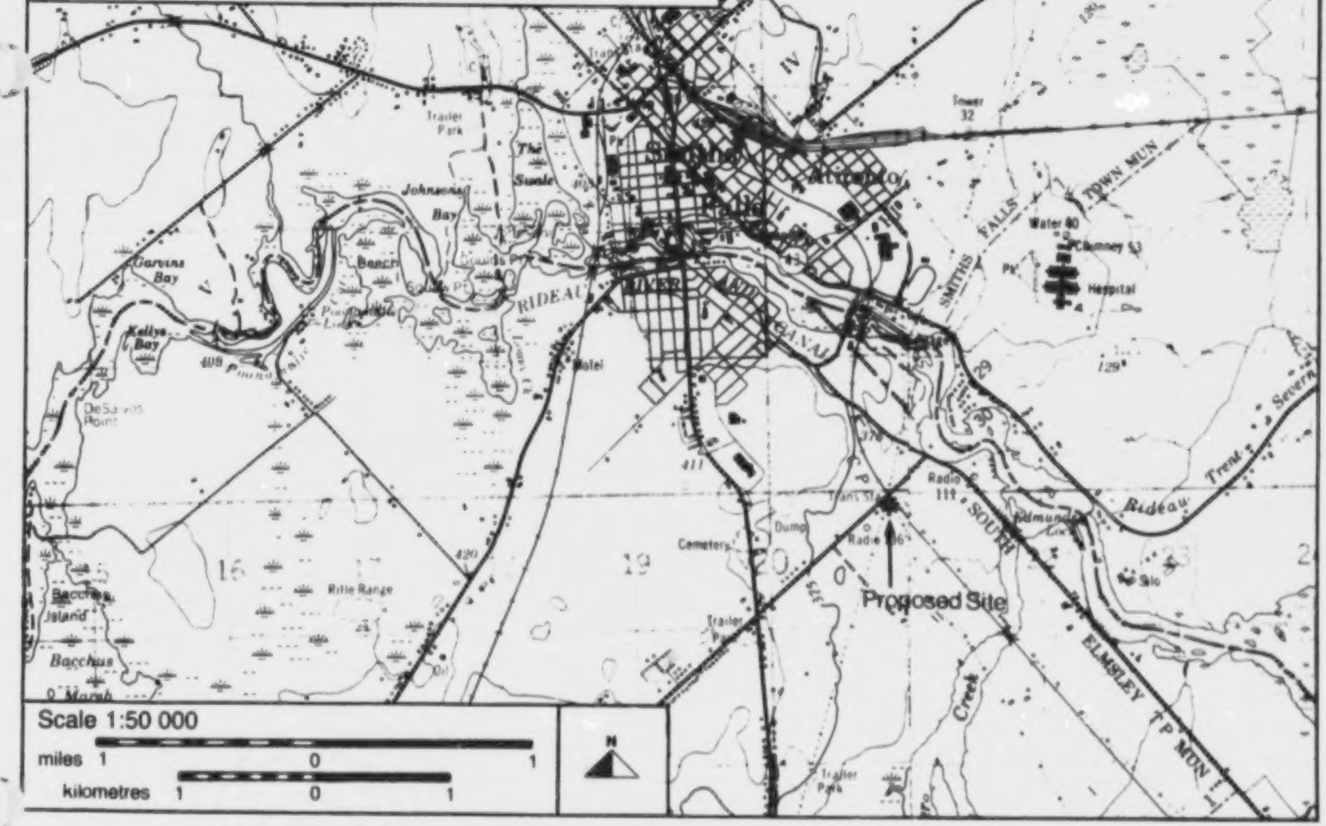
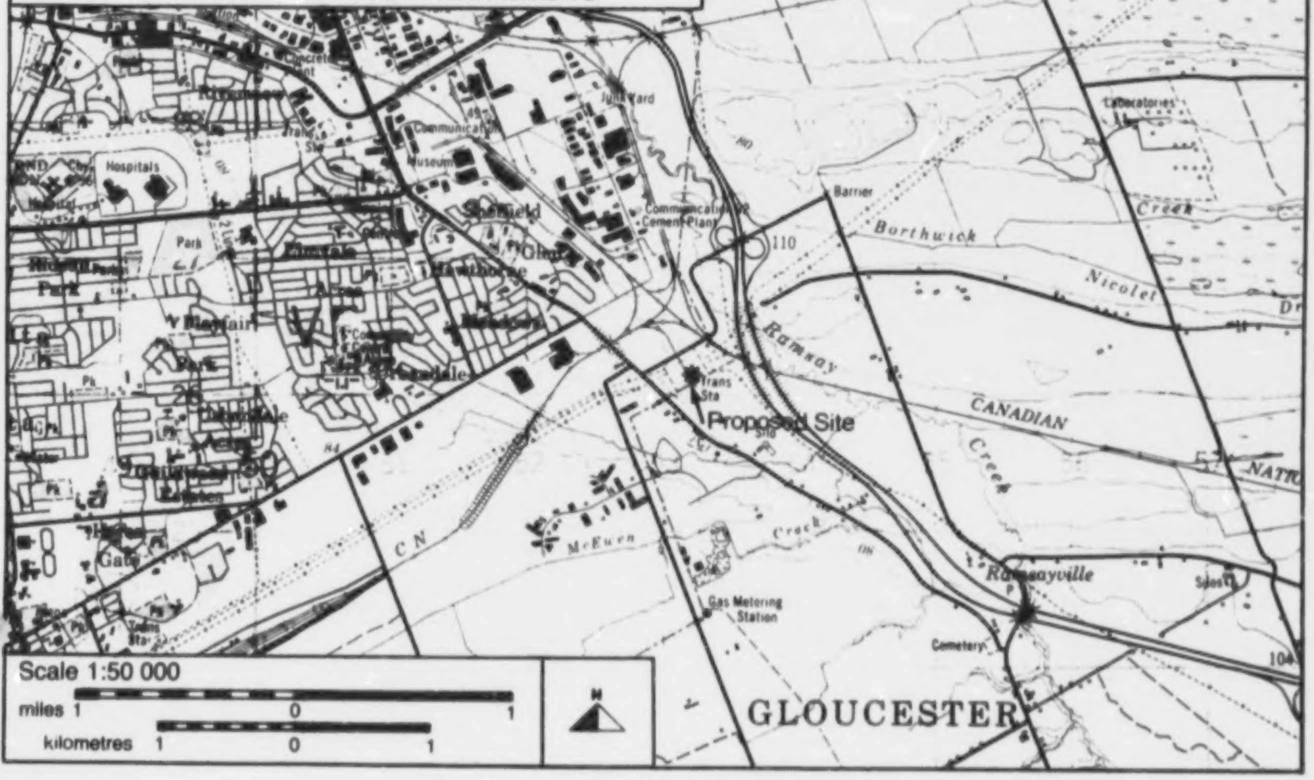

Proposed Site
Trans Sta
Radio
Dump
Cemetery
Trailer Park
Rifle Range
Motel
Hospital
Chimney
Water
Tower 32
RIDEAU RIVER AND CANAL
SMITHS FALLS TOWN MUN
ELMSLEY TP MUN
SOUTH
Rideau
Trent Severn
Johnsons Bay
Garvins Bay
Kellys Bay
Poonamalie
DeSalvos Point
Bacchus Island
Bacchus Marsh
Creek
16
17
19
20
IV
V
Scale 1:50 000
miles 1 0 1
kilometres 1 0 1
N

Figure 11.4 - Eastern Ontario Study – Telecommunications Recommended Site at Hawthorne TS


Proposed Site
Trans Sta
CANADIAN
CANADIAN
NATIO
CN
Borthwick
Creek
Nicolet
Ramsay
Creek
McEwen
Creek
Ramsayville
Cemetery
Gas Metering Station
Barrier
Laboratories
Junk Yard
Communication
Cement Plant
Museum
Hospitals
Park
Sheffield Glen
Hawthorne
Elmvale
Alta Vista
Blossom Park
Gloucester
GLOUCESTER
110
Scale 1:50 000
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11.4 Description of Alternative Sites

All of the sites identified are situated adjacent to all weather access roads and attempt to minimize the length of on-site access required. Furthermore, all of the sites are located on properties which contain no known conflicts with existing land uses.

The sites in the North Crosby/South Sherbrooke study area are located as far away as possible from Westport to the south and from the cottaging lakes to the north (refer to Figure 11.1).

The sites in the Goulbourn/Beckwith study area (see Figure 11.2) are positioned to be as far away as possible from the human settlement concentrations of Ashton, Prospect, Munster, and Stittsville.

Line Numbers

12.0 EVALUATION AND COMPARISON OF ALTERNATIVE SITES

12.1 Evaluation of Alternative Sites

Each alternative site was examined in more detail from land use, environmental, technical and economic perspectives.

The location of the sites was referenced to lot and concession. Land use of the site including official plan designations and zoning was investigated. Adjacent land uses were also observed and documented. Natural environment considerations included descriptions of vegetation, soils, slope and drainage. A visual impact component was also included which took into account tower height, and extent of tower visibility from nearby human settlement concentrations.

The technical and economic considerations dealt with site conditions for construction, approximate construction costs, accessibility, proximity to commercial power supply and other technical concerns. A similar but less detailed analysis was conducted for the sites at Smiths Falls and Hawthorne TS. Environmental and technical information for the North Crosby/South Sherbrooke area sites, Goulbourn/Beckwith area sites and transformer station sites is provided in Tables 12.1, 12.2 and 12.3 respectively.

12.2 Comparison of Alternative Telecommunications Sites

12.2.1 North Crosby/South Sherbrooke Area Sites

All the sites (W1 to W8) are located on areas designated Rural in the Tay Valley and North Leeds official plans. Adequate provisions are contained with the official plan policies allowing for the establishment of various electric power facilities.

The corresponding zoning for each of the sites is rural with the exception of W4 which is zoned Hazard Land. Furthermore, both the South Sherbrooke Township Zoning By-law No. 502 as amended by By-law No. 524 and the North Crosby Township Zoning By-law No. 83-5 list "A communication tower" as a permitted use in the Rural Zone. Both townships were consulted before finalizing the dimensions of the alternative sites. The areas of the sites identified in North Crosby and South Sherbrooke are .4 ha and .2 ha respectively.

All of the sites are located on lands which contain no apparent active land use or buildings or other man-made structures. However, the owner of site W5 stated that a residence is planned at this location and from his perspective, this constitutes a land use conflict.

Adjacent land uses and development vary amongst the sites. Loam extraction occurs in the wet areas next to site W1 and 2 residences are in proximity (within 1 kilometre). Sites W2 and W3 are located in proximity to 4 and 5 residences respectively. No land use or development, however, is evident immediately adjacent to these 2 sites. Site W5 is located on abandoned agricultural land between 2 farms. A total of 5 residences are in proximity of this site. Site W4 is is adjacent to 1 residence and is in proximity to 8 more. Site W6 has no adjacent development on land uses evident but is in proximity to 5 residences. Site W7 has no evident land use or development adjacent to the site and is in proximity to 3 residences. Finally W8 has no immediate or adjacent land use or developments adjacent to the site and has 1 farm located within 1 kilometre.

Table 12.1
Alternative Site Evaluations
North Crosby/South Sherbrooke Study Area

DESCRIPTION	W1	W2	W3	W4	W5	W6	W7	W8
A. SITE LOCATION	LOT 20, CONC. 7 NORTH CROSBY TWP	LOT 17, CONC. 7 NORTH CROSBY TWP	LOT 19, CONC. 5 NORTH CROSBY TWP	LOT 19, CONC. 3 NORTH CROSBY TWP	LOT 14, CONC. 4 NORTH CROSBY TWP	LOT 20, CONC. 2 NORTH CROSBY TWP	LOT 14, CONC. 1 SOUTH SHERBROOKE TWP	LOT 3, CONC. 3 SOUTH SHERBROOKE TWP
B. LAND USE								
- ON-SITE	- VACANT	- VACANT	- VACANT	- VACANT	- VACANT	- VACANT	- VACANT	- VACANT
- IN PROXIMITY TO SITE	- LOAM EXTRACTION IN PROXIMITY TO SITE - 2 RESIDENCES WITHIN 1 KM	- 4 RESIDENCES WITHIN 1 KM	- 5 RESIDENCES WITHIN 1 KM	- 8 RESIDENCES WITHIN 1 KM	- 5 RESIDENCES WITHIN 1 KM	- 5 RESIDENCES WITHIN 1 KM	- 3 RESIDENCES WITHIN 1 KM	- 1 RESIDENCE WITHIN 1 KM
- OFFICIAL PLAN DESIGNATION	- RURAL	- RURAL	- RURAL	- RURAL	- RURAL	- RURAL	- RURAL	- RURAL
- ZONING	- RURAL	- RURAL	- RURAL	- HAZARD LAND	- RURAL	- RURAL	- RURAL	- RURAL
C. NATURAL ENVIRONMENT CONSIDERATIONS								
- VEGETATION	- IMMATURE MIXED FOREST WITH LOCALIZED CLEARINGS	- OPEN WITH SCATTERED TREES AND SHRUBS	- OPEN WITH SCATTERED TREES AND SHRUBS	- OPEN WITH SCATTERED TREES AND SHRUBS	- GRASSLAND WITH SCATTERED TREES AND SHRUBS	- PARTIALLY TREED	- PARTIALLY TREED AND ABANDONED PASTURE	- HEAVILY TREED
- SOILS	- ROCK, SANDY LOAM AND MUCK - CLASS 7 SOIL CAPABILITY	- ROCK WITH SHALLOW SANDY LOAM - CLASS 7 SOIL CAPABILITY	- ROCK WITH SHALLOW SANDY LOAM - CLASS 7 SOIL CAPABILITY	- ROCK WITH SHALLOW SANDY LOAM - CLASS 7 SOIL CAPABILITY	- ROCK WITH SHALLOW SANDY LOAM - CLASS 7 SOIL CAPABILITY	- ROCK WITH SHALLOW SANDY SOILS - CLASS 7 SOIL CAPABILITY	- SHALLOW AND STONY SANDY LOAM - CLASS 7 SOIL CAPABILITY	- SHALLOW AND STONY SANDY LOAM WITH ROCK OUTCROPS - CLASS 7 SOIL CAPABILITY
- SLOPE	- FLAT	- FLAT	- GENTLY SLOPED	- MODERATELY SLOPED	- FLAT	- MODERATELY SLOPED	- MODERATELY SLOPED	- STEEPLY SLOPED
- DRAINAGE	- POORLY DRAINED ON MUCK - GOOD DRAINAGE ON ROCK AND SANDY LOAM	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD
D. VISUAL CONSIDERATIONS								
- APPROXIMATE TOWER HEIGHT (M)	- 81	- 61	- 69	- 84	- 79	- 91	- 70	- 107
- TOWER VISIBILITY	- VISIBLE FROM SOUTH HALF OF WOLFE LAKE 4.0 KM AWAY	- PARTIALLY VISIBLE FROM ROES BAY 5.6 KM AWAY	- VISIBLE 2.9 KM SOUTH OF ROES BAY	- COMPLETELY VISIBLE FROM NORTH SHORE OF CROSBY LAKE 3.7 KM AWAY	- VISIBLE SOUTH OF ROES BAY 4.0 KM AWAY	- COMPLETELY VISIBLE FROM NORTH SHORES OF CROSBY AND PIKE LAKES 4.0 KM AWAY	- PARTIALLY VISIBLE FROM SOUTH SHORE OF CROSBY LAKE 1.6 TO 3.2 KM AWAY	- PARTIALLY VISIBLE FROM BOB'S, FARRELL AND DAVERN LAKES 2.4 TO 4.0 KM AWAY
E. TECHNICAL/ ECONOMIC CONSIDERATIONS								
- SITE CONDITIONS	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD
- APPROXIMATE CONSTRUCTION COST ($1000'S)*	- 159	- BASE	- 84	- 187	- 144	- 209	- 111	- 289
- ROAD ACCESS - TO SITE - ON SITE	 - GOOD - GOOD	 - GOOD - GOOD	 - GOOD - GOOD	 - GOOD - LONGER ACCESS ROAD REQUIRED	 - GOOD - GOOD	 - GOOD - STEEPER ACCESS ROAD REQUIRED	 - GOOD - LONGER ACCESS ROAD REQUIRED	 - GOOD - LONGER AND STEEPER ACCESS ROAD REQUIRED
- POWER SUPPLY	- 0.8 KM TO THE SOUTH	- ADJACENT TO SITE	- ADJACENT TO SITE	- ADJACENT TO SITE	- ADJACENT TO SITE	- ADJACENT TO SITE	- ADJACENT TO SITE	- ADJACENT TO SITE

* AS COMPARED TO BASE COST.

Table 12.2
Alternative Site Evaluations
Goulbourn/Beckwith Study Area

DESCRIPTION	M1	M2	M3	M4	M5	M6
A. SITE LOCATION	LOT 11. CONC. 12 GOULBOURN TWP	LOT 14. CONC. 11 GOULBOURN TWP	LOT 6. CONC. 1 GOULBOURN TWP	LOT 24. CONC. 6 BECKWITH TWP	LOT 26. CONC. 5 BECKWITH TWP	LOT 6. CONC. 2 GOULBOURN TWP
B. LAND USE						
- ON-SITE	- VACANT	- VACANT	- INACTIVE PORTION OF PIT	- VACANT	- VACANT	- VACANT
- IN PROXIMITY TO SITE	- 1 RESIDENCE WITHIN 1 KM - GOLF COURSE TO THE SOUTHWEST	- 4 RESIDENCES WITHIN 1 KM - ADJACENT TO PIT	- 3 RESIDENCES WITHIN 1 KM	- 6 RESIDENCES WITHIN 1 KM	- 3 RESIDENCES WITHIN 1 KM	- 4 RESIDENCES WITHIN 1 KM
- OFFICIAL PLAN DESIGNATION	- MARGINAL RESOURCE AREA	- MINERAL RESOURCE AREA	- MARGINAL RESOURCE AREA	- RURAL	- RURAL	- MARGINAL RESOURCE AREA
- ZONING	- GENERAL RURAL	- GENERAL RURAL	- GENERAL RURAL	- RURAL	- RURAL	- GENERAL RURAL
C. NATURAL ENVIRONMENT CONSIDERATIONS						
- VEGETATION	- SCATTERED TREES AND SHRUBS	- MIXED FOREST	- MIXED FOREST ADJACENT TO PIT	- CEDAR FOREST	- MIXED FOREST	- PARTIALLY TREED AND ABANDONED PASTURE
- SOILS	- SANDY LOAM AND MODERATELY STONY - CLASS 5 SOIL CAPABILITY	- COARSE SANDY LOAM AND MODERATELY STONY - CLASS 4 SOIL CAPABILITY	- SANDY LOAM AND VERY STONY - CLASS 7 SOIL CAPABILITY	- SANDY LOAM AND MODERATELY STONY - CLASS 6 SOIL CAPABILITY	- SANDY LOAM AND EXCEEDINGLY STONY - CLASS 6 SOIL CAPABILITY	- SANDY LOAM AND MODERATELY STONY - CLASS 6 SOIL CAPABILITY
- SLOPE	- VERY GENTLY SLOPING	- VERY GENTLY SLOPING	- VERY GENTLY SLOPING	- FLAT	- FLAT	- VERY GENTLY SLOPING
- DRAINAGE	- GOOD	- GOOD	- GOOD TO POOR	- GOOD	- GOOD	- GOOD TO POOR
D. VISUAL CONSIDERATIONS						
- APPROXIMATE TOWER HEIGHT (M)	- 122	- 82	- 72	- 110	- 85	- 91
- TOWER VISIBILITY	- VISIBLE FROM SCATTERED DEVELOPMENT AND HWY 7	- VISIBLE FROM SCATTERED DEVELOPMENT AND HWY 7	- VISIBLE FROM FARMS AND RURAL RESIDENCES TO THE NORTHWEST	- VISIBLE FROM FARMS AND RURAL RESIDENCES TO THE NORTH	- VISIBLE FROM PROSPECT AND SURROUNDING FARMS AND RURAL RESIDENCES	- VISIBLE FROM FARMS AND RURAL RESIDENCES AROUND AND SOUTH OF DWYER HILL
E. TECHNICAL/ ECONOMIC CONSIDERATIONS						
- SITE CONDITIONS	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD
- APPROXIMATE CONSTRUCTION COST ($1000's)*	- 246	- 60	- BASE	- 192	- 80	- 95
- ROAD ACCESS - TO SITE - ON SITE	 - GOOD - GOOD	 - GOOD - GOOD	 - GOOD - GOOD	 - GOOD - GOOD	 - GOOD - GOOD	 - GOOD - GOOD
- POWER SUPPLY	- ADJACENT TO SITE	- 0.6 KM TO THE NORTH	- ADJACENT TO SITE	- ADJACENT TO SITE	- 0.8 KM AWAY	- ADJACENT TO SITE

* AS COMPARED TO BASE COST.

Table 12.3
Recommended Sites at Existing Transformer Stations

Description	Smiths Falls TS	Hawthorne TS
A. Site Location	Lot 1, Conc. 2 South Elmsley Twp	City of Ottawa Walkley and Hwy 417
B. Land Use		
- Existing	- Transformer Station	Transformer Station
- In Proximity to Site	- Residential, Industrial and Agricultural	- Industrial, Agricultural and Residential
- Official Plan Designation	- Rural	- Major Industrial Area
- Zoning	- Agricultural	- M4 (Industrial)
C. Natural Environment Considerations	- Not Applicable	- Not Applicable
D. Visual Considerations		
- Approximate Tower Height (m)	- 70	- 91
- Tower Visibility	- Visible from Surrounding Area	- Visible from Surrounding Area

The visibility of the sites is dependent upon tower height, surrounding topography and proximity to human settlement concentrations and existing travel routes. The site that would have the least overall visibility is W3. It would not become visible from the south until a point 1.8 km south of Roes Bay near Westport. Site W2 would have the next least degree of visibility because the top of the tower would just begin to come into view at Roes Bay. Site W1 ranks third and would be visible beyond the south end of Wolfe Lake. Site W5 is ranked fourth because it would begin to appear at Roes Bay similar to W2 but is closer by 1 km. Site W8 would be partially visible from Bobs, Farren and Davern lakes. W7 would be partially visible from the south shore of Crosby Lake but would have a greater visibility than W8 because it is closer to cottages. Ranked next is W4 which would be completely visible from the north shore of Crosby Lake. Finally W6 would have the highest visibility and would be completely visible from the cottages along the north shores of Crosby and Pike lakes.

The effect on the natural conditions of each site would be dependent on the amount of vegetation cleared and the length of access road required.

Sites W1 and W8 have the greatest amount of tree cover and W8 would require the most clearing due to the need for a longer access road. The other sites range from being partially vegetated with scattered trees and shrubs to completely open. Of these sites W4 and W7 would require the longest access roads. In addition, site W1 would require 0.8 km of power distribution line built along the existing township road, resulting in even further clearing of vegetation.

The owner of site W5 informed Ontario Hydro that he no longer wished to have his property considered as an alternative site because of future plans. Several neighbours of sites W3 and W4 expressed concern with the location of these sites through comment forms and letters. Their concerns centered on aesthetics, possible property devaluation, possible effects on radio and TV reception, and utilization of existing Bell Canada facilities. No specific comments were received on any of the other alternative sites.

All of the sites identified in this study area are technically acceptable. Each site is located in an area with suitable sub-surface conditions for adequate tower foundations. Access to all sites is good, though on site access is best at sites W1, W2, W3, and W5. Local electrical distribution lines are adjacent to all sites except W1 where they are about .8 km away.

The cost of acquiring property and constructing a tower at each site varies by as much as $289,000. This variance is related primarily to the height of tower required. Site W2 would be the least costly with site W3 in the same range. Sites W1, W4, W5, and W7 would be moderately more expensive and the extra costs associated with sites W6 and W8 would be most significant.

The technical/economic information related to these sites is summarized in Table 12.1.

12.2.2 Goulbourn/Beckwith Area Sites

The official plan land use designations for the six alternative sites are as follows:

Line Numbers

Rural

- M4 and M5 (North Lanark Official Plan)

Marginal Resource Area

- M1, M3 and M6 (RMOC - Official Plan)

Mineral Resource Area

- M2 (RMOC - Official Plan)

Both official plan policies provide general provisions permitting public utilities.

Zoning By-law No. 77-60 for Goulbourn Township makes adequate provision for "A communications tower" as a permitted use in the General Rural Zone (RU2). Similarly, Zoning By-law No. 79-18 for Beckwith Township makes provision for a "communications facility" in its Rural Zone. All the sites are located on lands in rural zones, and would conform to the by-laws. Both townships were contacted before finalizing the dimensions of the alternative sites. All the identified sites measure .4 ha in area.

All the alternative sites are located on vacant land with no evidence of development or land use activities.

There are no apparent land uses immediately adjacent to site M1. There is however a golf course to the southwest on the far side of Highway 7. This site is in proximity (within 1 kilometre) to 1 residence. M2 is located adjacent to a licensed pit with no other adjacent uses evident. It is in proximity to 4 residences. Site M3 is located on the abandoned portion of a licensed pit and is within 1 km of 3 residences. Site M4 has farm fields located to the south and rural residences to the north. It is in proximity to 6 residences. Site M5 has some adjacent residential development occurring and is within 1 kilometre of 3 residences. Finally, site M6 is located adjacent to abandoned agricultural land and is within 1 km of 4 residences.

The potential visibility of each of the sites is largely dependent upon the estimated tower height, the degree of development in the surrounding area and proximity to travel routes. Since the study area is relatively flat with a large proportion of it cleared for agriculture, the visibility of each site would be similar assuming equal tower heights. Significant tower height differences have been estimated, resulting in a variation of visibilities.

A tower at site M3 would have the least visibility because it represents the lowest tower in an area with a low number of residences within a kilometer radius. The area to the east and south is sparsely developed because of the presence of the Richmond Bog. Site M6 ranked second in visibility being in the same general area as M3 but requiring a tower which would be 19 m higher.

Ranked third, site M2 is 0.5 km south of Highway 7 and would be highly visible from the motorists and the scattered residents located to the east along the highway. Site M5 would be highly visible from Prospect and the surrounding farms and site M4 to the north would also be visible from Prospect due to a considerable increase in tower height (25 m). Site M4 is also situated closer to homes and farms than Site M5. Finally, site M1 is located on the north side of Highway 7 and would require the highest structure at 122 m. This tower would be in full view of the motorists, users of the golf course and the rural residents in the surrounding area, and as a result constitutes a site alternative that would have the highest visibility.

Site M3 would result in the least disruption to the natural environment since it is located on an abandoned portion of a licensed gravel pit. No clearing would be required at this location. Being situated on abandoned pasture, site M6 would also require very little if any tree clearing. Site M1 would involve minor clearing due to the presence of scattered trees and shrubs.

The remaining sites, namely M2, M4 and M5 are forested and as such would require clearing for both the site and the access road.

The owner of site M2 wrote to inform Ontario Hydro that he no longer wished to have his property considered as an alternative site because of future plans. Several neighbours of site M5 expressed concerns with the location of this site at the MPCs and through comment forms. The owner of site M5 indicated that he had severed a number of lots in the vicinity of the alternative site for residential development. The owner of site M6 indicated that a tower located on this property may interfere with his future plans.

Generally, public concerns were related to aesthetics and the possibility of electrical effects including those on radio and TV reception.

All the sites identified are technically acceptable although there are economic advantage associated with some sites. Foundation conditions are comparable and access to and on all of the sites is good. Sites M2 and M5 are further away from local electric distribution lines.

The cost of acquiring property and constructing a tower at each site varies by as much as $246,000. Site M3 would be the least costly with sites M2, M5 and M6 in the same cost range. The extra costs associated with sites M4 and M1 would be most significant.

In all cases, the length of access road to the site would be kept to a minimum. Sites M2 and M5, however, would require 0.6 km and 0.8 km respectively of new distribution power line resulting in clearing along the existing road allowances.

The technical/economic information related to these sites is summarized in Table 12.2.

Line Numbers

13.0 SELECTION OF RECOMMENDED TELECOMMUNICATIONS SITES

13.1 Selection Rationale

As a result of the evaluation and comparison process, sites W2 and M3 were selected as the recommended sites for the following reasons:

W2 - North Crosby/South Sherbrooke Study Area

- vacant land with very low productive capability
- few residents in immediate vicinity
- low visibility
- best access and site conditions
- lowest cost
- willing seller (30 month option obtained)

M3 - Goulbourn/Beckwith Study Area

- abandoned pit with no additional granular material present
- few residents in immediate vicinity
- low visibility
- best access and site conditions
- lowest cost
- willing seller (30 month option obtained)

No alternatives to a site at Smiths Falls were considered for the following reasons:

- located on existing Ontario Hydro property
- near industrial area
- few residents in immediate vicinity
- excellent site conditions
- potential for eliminating leased telecommunications facilities

No alternatives were considered to the site at Hawthorne TS because the facilities are technically required at this location. This site has the advantage of being in an industrial area with few residents in the immediate vicinity.

13.2 Summary of Potential Effects and Mitigation

Acquisition for full ownership by Ontario Hydro will be required for Site W2 in North Crosby Township and Site M3 in Goulbourn Township. Payment for the sites would be based on the market value of the land, together with compensation for damages and injurious affection where applicable.

Any environmental effects resulting from construction are expected to be minor and would be addressed through use of the 'Construction and Site Restoration Guidelines for Transmission Facilities, March 1981', as approved by the Minister of the Environment.

Reduction of visual effects associated with the presence of these structures was dealt with during the site identification process. The extent of tower visibility could be minimized in specific locations but generally could not be reduced further due to the height of these facilities.

Line Numbers

13.3 Public Involvement

In May, 1984, prior to the final set of MPCs, notice of the recommended sites was mailed to those on the project mailing list which includes site owners and neighbours. This mailing included Bulletin No. 4 and a map of the recommended site locations.

General information on the study was available at all MPCs and specific information at the North Crosby, Goulbourn, South Elmsley, Smiths Falls, Montague and Ottawa MPCs. A specific telecommunications comment form was available to facilitate site specific comments from interested neighbours.

Separate meetings may be held with small groups of neighbours subsequent to the MPCs to discuss specifics related to construction, schedule and related activities.

14.0 Telecommunications Site Finalization

14.1 Meetings with Property Owners and Neighbours

After the locations of the sites have been approved, a meeting would be held with the owners of the sites to explain the status and discuss any specific concerns. The owners would be introduced to the Ontario Hydro property contact for the remainder of the project and the process of property acquisition explained. Permission to enter the properties for surveying and soil testing would be sought.

Meetings with neighbours of the approved sites could be scheduled as required to explain the construction procedures and to answer questions.

14.2 Final Design

The communications system design would be done and a specification, stipulating detailed system performance, equipment, material and labour requirements, would be prepared and would become part of the tendering document.

After award of a contract, the prime contractor would be responsible for conducting a path survey to verify path profiles and tower heights to ensure the system reliability is met. This would encompass such activities as field surveys, site tests, aerial surveys, etc, at the selected repeater sites and high elevation points along the signal route. No construction work would commence until all field surveys are completed.

14.3 Property Acquisition

Acquisition of all property rights required for the undertaking would be carried out in accordance with Ontario Hydro real estate acquisition policy. Full ownership would be acquired for the two sites not located on existing Ontario Hydro property.

14.4 Construction

Initially, the area would be graded, appropriate drainage facilities installed and foundation work completed. Tower foundations would usually require excavation at the site and would be constructed of reinforced concrete. The tower would be assembled on the ground in sections and raised by a crane. During construction, temporary fencing would be erected in order to meet specific municipal or county requirements. Upon completion of the construction, and prior to placing the equipment in service, the area outside the station could be landscaped. All excess material, debris, rubbish and temporary structures, etc, would be removed from the site. Efforts would be made to retain existing trees, bushes and farmers' fences to minimize disturbance to the existing surroundings.

All microwave radio towers would be self-supporting and conform with CSA Standard S37-1965. Upon completion of the construction of each tower, the contractor would be required to provide an affidavit, certifying that the tower has been inspected and conforms to CSA Standards.

14.5 Operation and Maintenance

The operation of the microwave radio repeater station would be automatic; that is, it is unattended. Routine maintenance would consist of an annual check of operating voltages and signal levels. Emergency maintenance would be performed upon receipt of equipment failure alarms at the Richview Microwave Radio Alarm Centre. Generally, a microwave radio repeater station could require one or two visits a year to replace defective components. In addition, two visits a year would be made to the radio station to place the 48 V battery plants on equalize charge and to perform other duties.

APPENDIX A

GLOSSARY OF TERMS

Advisory Group - an advisory committee composed of representatives from government ministries, departments and agencies, municipalities, public interest groups and other interested individuals, who helped establish priorities for the level of importance of the objective 'resource value' and the relative environmental 'constraint'.

Alternating Current (AC) - current that reverses its direction of flow at regularly recurring intervals of time.

Alternative Methods of - the various generic ways of handling the preferred alternative that receive detailed consideration and may involve minor differences but still achieve the objective in basically the same manner, example: alternative location, alternative tower types, alternative construction techniques.

Alternative To - a structural or non-structural activity that meets the objectives or purpose of the proponent but does so in a significantly different manner than those types of activities from which the undertaking is ultimately selected.

Ampere (amp) - a unit of measurement for the flow of electrical current.

Autotransformer - a power transformer with a single main winding per phase with both primary and secondary connections made to the single winding.

Band - a linear, irregularly shaped geographic area, of a defined minimum width, within which the probability of finding acceptable locations for transmission facilities seems greatest in light of the constraints identified during the Plan Stage Study.

Base Load - the minimum continuous amount power required over a long period of time (minimum of one month).

Bulk Power Electricity System - the transmission, switching, transformation and other terminal station facilities which connect the principal sources of power generation and the major load centres. At present voltage levels of 500 kV and 230 kV are used in Ontario Hydro's bulk power transmission network.

Bus - heavy conductors in a transformer station to which components such as transformers or transmission circuits are connected, by means of circuit breakers or switches.

Cable TV Headend - the portion of a cable TV system where the radio and television signals are received and processed before distribution to individual subscribers. At the cable TV headend, the signals may be received via off-air broadcast stations, microwave radios, satellite earth stations, and/or generated locally via video/audio recorders.

Capacitance - the property of a system of conductors and dielectrics that permits the storage of electrical charges.

Capacitor - a static device used to improve the power factor of the power system or to improve power system voltages.

Centreline - a line drawn on maps (orthophotos) that represents the centre of the final right of way and the location of the transmission line itself.

Circuit - a set of conductors, insulated from each other, three for a three phase system, two for a single phase system, through which electric current is intended to flow.

Circuit Breaker - a heavy duty switch which is used to switch power system components in or out of service and which is capable of being automatically opened to separate components from the system.

Cogeneration - the utilization of waste heat from an industrial process to produce electricity.

Combined Cycle Plant - a plant that uses waste heat from large gas turbines (driven by gases from the combustion of hydrocarbon fuels) to generate steam for conventional steam turbines. Both the gas and the turbines could be used to produce electricity.

Comparison - the part of the land use and environmental planning process in which the advantages and disadvantages among alternatives are systematically assessed.

Conductor - a wire or combination of wires not insulated from one another, designed to carry electric current. It may be bare or insulated.

Constraint Map - a map which displays the geographic distribution of areas of differing limitations to the location of transmission facilities; determined as the relative sensitivity of land use and environmental resources to change as a result of transmission line development.

Corona - a luminous electric discharge resulting from the breakdown of the insulating properties of the air surrounding a conductor.

Corridor - a linear, geographic area of approximately 1,500 m in width, within which the probability of finding acceptable locations for transmission facilities seems greatest in light of the constraints identified during the Route Stage Study.

Counterpoise - a conductor or system of conductors arranged beneath a transmission line which are located above, on, or more frequently below the surface of the earth and connected to the footings of the tower or poles supporting the line. The purpose of these ground wires is to lower the ground resistance and thereby reduce system outages as a result of lightning strikes or switching surges.

Cycle - one complete set of positive and negative values of alternating current. A cycle usually consists of one positive pulse followed by one negative pulse. (See frequency.)

Direct Current (DC) - current which, under normal conditions, continues to flow in one direction only.

Direct Effect - the immediate and measurable physical alterations to the environment caused by construction and operation of transmission facilities.

Distributing Station (DS) - a group of electrical components which receive electrical power at one voltage (115 kV or less) and which transform those voltages to a lower voltage suitable for distributing the power to local customers.

Line Numbers

Distribution Line - the facilities, overhead or underground, at voltages as high as 44 kV for transporting small amounts of power from a distributing station or a regional supply centre to the customers' local transformer.

Electric Energy - the energy associated with the product of voltage and current over an interval of time. Energy is measured in kilowatt-hours.

Electric Field - a state existing in a medium between two bodies at two different electrical potentials. If an electric charge were placed there, it would have a force exerted on it tending to make it move.

Energy - the ability of a system of components to do work. It is equal to the average power that the system can sustain over an interval multiplied by the time duration of the interval.

Energy Demand - the average power required to meet the load over a stated interval of time.

Energy Load - energy measured at the point of delivery.

Environment - as defined in The Environmental Assessment Act, 1975, means:

(i) air, land, water

(ii) plant and animal life, including man

(iii) the social, economic and cultural conditions that influence the life of man or a community

(iv) any building, structure, machine or other device or thing made by man

(v) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities of man, or

(vi) any part or combination of the foregoing and the inter-relationships between any two or more of them.

Environmental Effect - a change in the present or future environment expected to be brought about either directly or indirectly as the result of the implementation of a proposal.

Evaluation - the part of the land use and environmental planning process in which the advantages and disadvantages for an alternative are systematically identified.

Fabric of the Land - the geographic orientation and/or political survey of the lot, concession, and township pattern.

Factor - a general component of the environment which is represented by a group of related objectives (i.e., Agricultural Resources, Biological Resources).

Factor Map - a map which displays the geographic distribution of the situations representing one factor.

Fault - failure of insulation on a power system component which results in extremely high current flow and very low voltage. The component must be disconnected immediately to minimize the effects of the fault on the power system and the component itself.

Fault Current - an electric current that flows from one conductor to ground or to another conductor owing to an unintentional electrical connection (including an arc) between the two.

Firm Demand - this is the electrical energy which must be supplied to purchasers on a continuous basis.

Firm Power - power available for use by the purchaser on a continuous basis.

Flashover - an electrical arc from one electrically charged object to another.

Frequency - the number of cycles of alternating current which occur in one second. Electric power frequency in North America is usually 60 cycles per second. A hertz is one cycle per second.

Gas Insulated Switchgear - an assembly of circuit breakers, switches and buses electrically insulated by pressurized gas (usually sulphur hexafluoride) enclosed by a metallic casing.

Generation - the electrical energy output by a generator.

Generator - a device which, when driven mechanically, produces electrical power.

Hydroelectric - development of electricity from falling water.

Impedance - the characteristic of electrical conductors which opposes the flow of alternating current. The net effect of the resistance and reactance.

Indirect Effect - secondary or induced effects which may occur on or off the right of way, resulting from the construction, presence, and operation of transmission facilities.

Inductance - the property of an electrical circuit whereby an alternating current induces a magnetic field. This magnetic field may induce a voltage in that circuit or a neighbouring circuit.

Integrated Power Systems - a system in which all power sources and all loads are physically interconnected in such a way that power can flow from any source to any load.

Interconnection - a transmission line which can carry power across the boundaries of service areas of adjacent electric utilities.

Interruption - the failure to supply power to a load.

Interruptible Loads - loads which under contract provisions may be interrupted within specified times and limits. In exchange for this agreement power is sold to the customer at a discount from the firm power rate.

In-service Date - the date a facility is declared available for commercial operation.

Joint Board - a tribunal composed of two members of the Ontario Municipal Board and one from the Ontario Municipal Board and one from the Ontario Environmental Assessment Board, established under the Consolidated Hearings Act (1981), to decide on matters pertaining to the eastern Ontario transmission study.

Kilo - as in kilometre, kilovolt, kilowatt, kilowatthour - the prefix kilo indicates the quantity or magnitude in thousands.

Link - the smallest geographic component in the network of route alternative which connects two interior terminal points.

Load - the amount of power or energy used by customers. It is measured in watts or megawatts.

Load Rejection - automatically interrupts selected customers without warning in order to prevent major system emergencies from causing widespread loss of power supply to all customers.

Losses - the power dissipated by the system itself because of the inherent resistance of transmission lines, transformers, etc. In other words, it is necessary to put more power than is needed into the system to ensure that the amount needed is available.

Magnetic Field - a state produced in a medium, either by current flow in a conductor or by a permanent magnet. It can induce voltage in a second conductor in the medium when the state changes or when the second conductor moves in prescribed ways relative to the medium or the first conductor.

Map Accuracy - a measure of the degree to which an area or feature is positioned and classified accurately.

Mega - as in Megawatt, Megawatthour - the prefix mega indicates the quantity or magnitude in units of a million.

Mitigation - includes the prevention, modification, or alleviation of environmental effects caused by the implementation of a project.

Objective Statement - a statement consisting of: (1) a directive to avoid a particular type of land use and environmental characteristic when locating transmission facilities; (2) a description of the importance of the resource; (3) a description of the magnitude of the possible effects if encountered; and (4) a description of the possible mitigation measures which could be applied to minimize the effects.

Operating Reserve - that spare generating capacity capable of producing energy within a short period of time - that is less than 30 minutes.

Outage - a temporary disconnection of a part of a system as the result of either a fault or scheduled maintenance. An outage may not necessarily result in an interruption in the supply of power.

Peak Load - the highest average load during a time interval of specified duration, for example, 20 minutes, occurring during a given period of time, such as one day.

Power - the rate of doing work, or, in an electrical network, the rate at which electrical energy is being supplied.

Power Transfer - a term used to describe the transportation of electrical power via conductors connecting two or more terminal stations or areas.

Present Worth - the equivalent value at a time designated as the 'present' of a particular future payment or receipt, or of all future payments and receipts associated with a given course of action, taking into account the time-related value of resources.

Rating - a technique used to assign a relative numerical value to the identified objectives, based on the description presented in the objective statements.

Reactance - that characteristic of an alternating current system that combines with resistance to form impedance. Reactance is associated with the energy stored in the magnetic field of an electrical circuit.

Re-conductoring - refers to work associated with replacing existing transmission line conductors, usually with those of a larger size.

Resistance - the characteristics of electrical conductors which opposes the flow of that part of the electrical current which is in phase with the voltage. It causes a voltage drop and power loss in the circuit.

Re-tensioning - refers to work associated with increasing the tension of overhead transmission line conductors. This would increase the distance between the ground and conductors, thereby permitting some increase in the amount of the power that could be transmitted.

Right of Way - the actual area required by Ontario Hydro to construct and operate the facilities for which approval is being requested.

Rip-rap - broken rock, cobbles or boulders placed on surfaces, such as the face of a dam or the bank of a stream, for protection against the action of water.

Route - a linear, geographic area which represents the approximate right of way for the proposed transmission facilities.

Security - the inherent capability of a power system to continuously supply electricity. This is accomplished through the planning of alternative sources or alternate lines of supply for customer loads. Security can also be affected by tower design and line specifications. A secure system is one which continues to function when sudden stresses, such as the loss of a component, occur within the system.

Shunt Capacitor - a static (no rotating parts) electrical device used to maintain adequate voltage in a power system.

Situation - an identified land use and environmental characteristic which is expected to be affected by transmission facilities and is displayed by combining specific data contained within the inventory.

Skylining - a situation that occurs when a transmission tower(s) is silhouetted against the sky as a result of being located on a high point of land. The viewer is generally at a lower elevation looking up through the tower.

Skywire - grounded wire placed above conductors of a transmission line of intercepting lightning strikes to protect the phase conductors.

Switching Station - a point in the power system where transmission lines are interconnected through circuit breakers.

Synchronous Condensor - a rotating machine for ensuring adequate system voltage.

Thermal-Electric Generating Station - a generating station which uses steam to rotate a turbine, which in turn drives an electric generator. The conventional fuels used to create heat for the production of steam are bituminous coal, lignite coal, oil, or natural gas. Nuclear reactors are also used as a heat source.

Trade Offs - benefits and disbenefits associated with one option which are compared to the benefits and disbenefits of another option, thereby arriving at the most acceptable choice between them.

Transformer Station - group of electrical components or elements arranged to transfer power from one voltage level to another; to terminate transmission circuits at the various voltage levels; and to provide for an interchange or redistribution of power among the circuits at each voltage level.

Transmission Line - the conductors and their supporting towers, used to convey electric energy from one point to another.

Viewshed - the area(s) which can be seen from a given location or the area(s) from which a specific feature is visible. The size of the vieshed is dependent upon the interaction of: the height of the viewpoint or feature relative to the surrounding terrain; the amount, type and height of surrounding vegetation; the presence of clearings or openings, such as lakes or fields; the presence of concentrations of buildings; and the relative distances between the viewer, destructions and the feature.

Volt - a unit of electrical pressure which tends to cause the flow of electrical current.

Watt - unit of electrical power; represents the power used when one ampere flows through circuit with a pressure of one volt.

APPENDIX B

LAND USE AND ENVIRONMENTAL PLANNING INFORMATION

Appendix B1

Data Types and Sources

Note - Data sources and contacts which contributed to the data base for both the corridor and route steps of study are listed. Individuals noted as personal contacts who are listed with an asterisk (*) are no longer with the organizations mentioned.

B1.1 AGRICULTURAL RESOURCES

Data Types

(1) Agricultural Land Use Systems (ERALU)

- monoculture - MONOC
- corn system - CORN
- mixed system - MIXED
- hay system - HAY
- pasture system - PASTR
- grazing system - GRAZE
- specialty agriculture - SPAGR

(2) Tile Drainage (ERDRA)

- tile drainage - DRAIN

(3) Soil Capability for Agriculture (Field Crops) (ERSCP)

- C.L.I. soil capability classes 1 to 7
- organic soils - O

Data Sources and Contacts

Published and Unpublished Data

- Forestry Agricultural Resources Inventory of Eastern Ontario (FARINEO), 1982, prepared by the Foodland Development Branch, Ontario Ministry of Agriculture and Food (OMAF), 87 p. + computer data.

- Tile Drainage Assistance Act Records 1930-1980, Foodland Development Branch, OMAF.

- Interpretation of 1979 Aerial Photographs, (1:30,000).

- Agricultural Land Use Systems of The Regional Municipality of Ottawa-Carleton Map, 1979, Soil Research Institute, Agriculture Canada, (1:30,000).

- Soil Capability for Agriculture Map, 1969, Canada Land Inventory, (1:50,000).

- Field Reconnaissance.

Personal Contacts

- Ministry of Agriculture and Food

Queen's Park (Toronto)

Nick Roller – Economics Branch

County Agricultural Representatives

Carleton – Don Black and Terry Stuart
Lanark – Russ Bradford and Stuart Leyenaar
Leeds – Charles Tanner and Jack Westlake
Frontenac – Emerson Jennings and Art Hamilton
Lennox and Addington – Bruce Hart

County Agricultural Engineers (Tile Drainage)

Lanark – R.D. Kelly
Frontenac
Leeds – Harold Cuthbertson
Lennox and Addington
Carleton – Patrick S. Plue

Foodland Development Branch (Toronto)

Dave Turner* – FARINEO data
Paul Radigan* – Drainage Coordinator
Ralph Davidson – Drainage Coordinator

- Agriculture Canada (Ottawa)

Ted Huffman – Soil Research Institute

- Ontario Federation of Agriculture

Frontenac – Dale Keeler

Ottawa-Carleton – Richard Fraser

Lanark – Doug Leach

- Property Owners

B1.2 APPEARANCE OF THE LANDSCAPE

Data Types

(1) Viewsheds of Provincial Highways (ERVHY)

- viewshed of Highway 15 - HWY15
- viewshed of Highway 29 - HWY29
- viewshed of Highway 38 - HWY38
- viewshed of Highway 42 - HWY42
- viewshed of Highway 43 - HWY 43
- viewshed of Highway 33 - HWY 33
- viewshed of Highway 401 - HY401
- viewshed of Highway 511 - HY511
- overlap - viewsheds of Highways 15 and 29 - 15A29
- overlap - viewsheds of Highways 15 and 42 - 15A42
- overlap - viewsheds of Highways 38 and 401 - 4013B
- overlap - viewsheds of Highways 15, 29 and 43 - V3HWY

- Hwy. 31 primary viewshed - 1P
- Hwy. 31 secondary viewshed - 1S
- Hwy. 401 primary viewshed - 5P
- Hwy. 401 secondary viewshed - 5S

(2) Viewsheds of Human Settlements (ERVHS)

- primary viewsheds of urban and rural residential concentrations - VURCP
- secondary viewsheds of urban and rural residential concentrations - VURCS

(3) Viewsheds of Lakes (ERVLK)

- viewsheds of cottage lakes - VCLKS
- viewsheds of other lakes - VOLKS

(4) Landscape Unit Number (ERANR)

- geographic units (over 200 values)

Derived Maps

(5) Landscape Unit Relative Relief - 0 to 300 feet (ERARC)

- relief units (29 values)

(6) Landscape Unit Crest Length (ERACL)

- long to short

(7) Landscape Unit Crest Pattern (ERACP)

- linear to random

(8) Landscape Unit Crest Orientation (ERACT)

- compass directions

(9) Landscape Unit Forest Density (ERAFD)

- precent coverage

(10) Landscape Unit Forest Pattern (ERAFP)

- hedgerows - HROWS
- no forest pattern - NONE
- scattered trees - SCATR
- bush - BUSH
- bush and woodlots -BUXWO
- woodlots - LOTS
- hedgerows and woodlots - LOTSH
- natural and hedgerows - NATRH
- natural - NATUR
- natural and bush - NAXBU

(11) Landscape Unit Man-Modification (ERAMM)

- classes 1-9

(12) Landscape Unit Morphology (ERAMY)

- flat to hilly

(13) Landscape Unit Water Density (ERAWD)

- high to low

(14) Landscape Unit Water Pattern (ERAWP)

- linear - random - complex

(15) Landscape Unit Water Shoreline (ERAWS)

- simple - complex

Data Sources and Contacts

Published and Unpublished Data

- Interpretation of 1979 Aerial Photographs, (1:30,000).
- Field Reconnaissance.
- Topographic Map Series, (1:50,000).

B1.3 BIOLOGICAL RESOURCES

Data Types

(1) Wildlife Communities (ERWC)

- deer habitat - DEER
- heronry - HERON
- rare/unusual fauna - FAUNA
- concentrations of non-game species - NGAME
- eagle nesting area - EAGLE
- Cliff Swallow colony - SWALO
- osprey nesting area - OSPRY
- moose concentration area - MOOSE
- deer habitat and moose concentration area - DRXMO
- deer habitat and cliff swallow colony - DRXCS
- bullfrog communities - BFROG
- deer habitat and rare or unusual fauna - DEFAU
- deer habitat, fauna and heronry - DEFAH

(2) Waterfowl Communities (ERFWL)

- waterfowl breeding areas - BREED
- waterfowl staging areas - STAGE

(3) Fish Communities (ERFC)

- cold water lakes, rivers, streams (resident/migratory) - COLD
- warm water lakes, rivers, streams - WARM
- spawning areas - SPAWN
- stocked trout lakes, rivers, streams - STOCK
- spawning areas and stocked trout streams, rivers, lakes - SPXST
- natural cold water fishery which is also stocked - CDXST
- warm water fishery with spawning - WMXSP

(4) Terrestrial Communities (ERTER)

- rare/unusual flora - FLORA
- wild rice areas - RICE
- significant/representative vegetation - VEGE
- rare/unusual flora and significant/representative vegetation - FLVEG
- wild rice and significant/representative vegetation - RIVEG

(5) Biological Management Areas (ERBMA)

- wildlife/waterfowl management areas - WWMA
- designated environmental protection areas - DEPA
- nature reserves - NATUR
- fish hatchery/trout farm - FISH
- proposed waterfowl management areas - PFOWL

- sport fisheries management lakes - SPORT
- scientific research area - RESCH
- designated environmental protection area and nature reserve - DENAT
- fish sanctuaries - FSANC
- Federal bird sanctuaries - FBSAN

(6) Wetlands (ERWET)

- biologically sensitive wetlands - WETHI
- wetlands with no identified biological information - WETLD

Data Sources and Contacts

Published and Unpublished Data

- Conservation Lands in Ottawa-Carleton, Background Reports 1-5, 1976, prepared by the Planning Department, RMOC.

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- MNR District Sensitive Area Reports.

- MNR Eastern Region, Earth and Life Science Sites Map (1:250,000).

- Wetlands Map, 1975, prepared by Ontario Hydro, (1:250,000).

- Carleton Place District Land Use Strategy, Draft Strategy, 1982, prepared by the Carleton Place District, MNR, 67 p.

- Napanee District Land Use Strategy, Draft Strategy, 1982, prepared by the Napanee District, MNR, 74 p.

- Tweed District Land Use Strategy, Draft Strategy, 1982, prepared by the Tweed District, MNR, 56 p.

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- Interpretation of 1979 Aerial Photographs, (1:30,000).
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- Lake Fish Communities Map, 1975, prepared by Ontario Hydro, (1:250,000).
- Brockville District Land Use Strategy, Draft Strategy, 1982, prepared by the Brockville District, MNR, 66 p.
- An Evaluation System for Wetlands in Ontario, March, 1983, First Edition prepared by Environment Canada and the Ontario Ministry of Natural Resources, 50 p. + appendix.
- Wetland Evaluation Reports for the Blueberry and Prospect Marshes and Marion Corners Long Swamp.
- Anon, 1982, Ontario Heronry Inventory, Vol. 2, prepared by the Long Point Bird Observatory for the Canadian Wildlife Service and Ontario Ministry of Natural Resources.
- Stream Fish Communities Map, 1975, prepared by Ontario Hydro, (1:250,000).
- Biological Features Map, 1980, prepared by the Planning Department, RMOC, (1:100,000).
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- Lonard, R.I., et al., 1981, Analysis of Methodologies Used for the Assessment of Wetlands Values, US Water Resources Council, Washington, D.C., 68 p. + appendices.
- Anon, March 1983, Wildlife and Habitat Inventory, Stony Swamp Conservation Area, prepared by Thurlow and Assoc. for the National Capital Commission, 14 p.
- Anon, 1983, An Evaluation System for Wetlands in Ontario, prepared by Environment Canada and the MNR.

- Brunton, D., 1982, Stony Swamp Life Sciences, prepared for the National Capital Commission, 142 p.
- Paine, C., 1983, Stony Swamp Conservation Area - Sector Development Plan, prepared for the National Capital Commission, 102 p.
- Flook, F., and S. Ashley, 1983, The Stony Swamp, A Changing Landscape, prepared for the National Capital Commission by Cardinal Research and Design, 53 p.

Personal Contacts

- Ministry of Natural Resources

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- Lindsay Penny - District Biologist
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- Canadian Wildlife Service (Ottawa)

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Ken Ross - Wildlife Biologist
Linda Maltby* - Wetlands Biologist

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- Ottawa Field Naturalists

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- Mississippi Valley Conservation Authority (Lanark)

Andy Burt - Manager
Sandy Hay - Planning Supervisor

- Napanee Region Conservation Authority (Napanee)

John DuChene - Manager
Jan Graves - Biology

- Rideau Valley Conservation Authority (Manotick)

  Cliff Craig - Planner

- Property Owners

B1.4 FOREST RESOURCES

Data Types

(1) Forest Management Areas (ERFMA)

- W.I.A. - WIA
- agreement forest - AGRFT
- county forest - CTYFT
- Forest experiment area - EXPAR
- Conservation Authority forest - CONAR
- seed cellection area - SEEDA
- Domtar forests - DOMFT

(2) Productivity of Forest Land (ERFLP)

- high productive forest land - HIPFL
- low productive forest land - LOPFL

(3) Forest Maturity (ERFMT)

- mature forest - MATUR
- immature forest - IMMAT
- young forest - YOUNG
- all-age stands - ALAGE

(4) Forest Associations (ERFAS)

- valuable hardwood species - VALHW
- valuable softwood species - VALSW
- intermediate value hardwoods - ITVHW
- intermediate value softwoods - ITVSW
- mixed woods of valuable species - MWVAL
- mixed woods of valuable and intermediate value species - MWVAI
- inferior hardwood or softwood species - INHAS
- conifer plantations - PLTSW
- hardwood plantations - PLTHW
- mixed wood of intermediate value species - MWITV
- sugar bush - SUGAR

Data Sources and Contacts

Published and Unpublished Data

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- Ontario Base Map (OBM) with Forest Stand Information (Draft), Brockville District, MNR, 1982, (1:10,000).
- Crown Land, WIA and Agreement Forests Map, Brockville District, MNR, 1981, (1:63,360).
- Brockville District Land Use Strategy, Draft Strategy, 1982, prepared by the Brockville District, MNR, 66 p.
- Carleton Place District Land Use Strategy, Draft Strategy, 1982, prepared by the Carleton Place District, MNR, 67 p.
- WIA Tract Maps, Carleton Place District, MNR, 1982, (1" = 109 chains - 20 chains).
- Public Lands Map, Lanark District, MNR, 1980, (1:253,440).
- Ontario Base Map (OBM) with Forest Stand Information (Draft), Carleton Place District, MNR, 1982, (1:10,000).
- Opportunities in Lanark County Map, Lanark District, MNR, 1980, (1:120,000).
- Crown Land, WIA and Agreement Forests Map, Ottawa District, MNR, 1978, (1:84,000).
- Administrative District Map, Napanee District, MNR, 1981, (1:126,720).
- WIA Tract Maps, Napanee District, MNR, 1982, (1" = 10 chains - 20 chains).
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- Crown Land, A Guide to its Use, Tweed District, MNR, 1980, (1:126,720).
- Ontario Base Map (OBM) with Forest Stand Information (Draft), Tweed District, MNR, 1982, (1:10,000).
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- Forest Stand Maps, Forest Resources Inventory, MNR, 1978, (1:10,000 photmosaic).

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- Willits, C.O., and C.H. Hills, 1976, Maple Syrup Producers Manual, Agr. Handbook No. 134, USDA.
- Agriculture Statistics for Ontario, 1981, prepared by the Ministry of Agriculture and Food.
- The Farm Woodlot, 1974, prepared by MNR.
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- Forest Cover Map of the Ottawa Greenbelt, 1975, prepared by the Forest Management Institute, Env. Canada, (1:10,000).
- Land Capability for Forestry Map, 1975, Canada Land Inventory, (1:250,000).
- National Capital Commission Greenbelt Map, 1974, (1:25,000).
- Regional Municipality of Ottawa-Carleton Map, 1981, prepared by the Planning Department, RMOC, for Ontario Hydro, (1:100,000).
- Domtar Forest Products, Property Map, 1981, (1:10,000).
- Interpretation of 1979 Aerial Photographs, (1:30,000).
- Sugar bush and plantations identified by property owners by lot and concessions, 1983.
- Field Reconnaissance.

Line Numbers

Personal Contacts

- **Ministry of Natural Resources**

Queen's Park (Toronto)

Brian Cardwell - FRI Supervisor
Art Manley - Air Photo Interpretation Supervisor
Al Nausedas - Economist
Bill Wardle - Economist

Regional Office (Kemptville)

Hank Devries - Forest Resources Branch

District Offices

Brockville
- Brian Buckley - Management Forester
- Bob Fleet - Project Forester
- Bill Raitanen - Hybrid Poplar Expert
- Bill Bentley - Senior Lands Technician

Carleton Place
- Jim McCready - Forest Section Supervisor

Napanee
- Jim Donaldson - Forester
- Terry Eccles - Senior Lands Technician

Tweed
- Brian Sears - Planner

- **Domtar Forest Products (Cornwall)**

Gerrit "George" Velema - Resident Forester, Cornwall
Russell Loszkowiat - Senior Forest Technician, Cornwall
Carl Burke - Senior Forest Technician, Cornwall

- **Property Owners**

B1.5 HERITAGE RESOURCES

Data Types

(1) Known Archaeological Sites (ERKAS)

- confirmed (Borden) sites - CONFD
- reported but unsubstantiated sites - UNSUB

(2) Known Historical Sites (ERKHS)

- settlements - 01
- mine sites - 02

- railways - 03
- roads - 04
- Rideau Canal - 05

(3) Areas of Historical Significance (ERAHS)

- settlements - 01
- mine sites - 02
- railways - 03
- roads - 04
- Rideau Canal viewshed - 05

(4) Cultural Landscapes (ERCL)

- intensive agrarian - A
- intensive - abandoned agrarian - AA
- marginal - abandoned agrarian - MA
- abandoned agrarian - natural cover - AFC
- mining - M
- natural - N
- urban - U
- water based/recreation - WBR

(5) Areas of High Paleo-Indian Archaeological Potential (ERPAL)

- Paleolithic areas - PALEO

(6) Areas of High Archaic Archaeological Potential (ERARH)

- Archaic areas - ARCH

(7) Areas of High Initial Woodlands Archaeological Potential (ERINI)

- Initial Woodlands areas - INITL

(8) Areas of High Terminal Woodlands Archaeological Potential (ERTWD)

- Terminal Woodlands areas - TERM

Data Sources and Contacts

Published and Unpublished Data

Historical

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- Heritage Studies on the Rideau-Quinte-Trent-Severn Waterway, 1970, Historical Planning and Research Branch, Ministry of Culture and Recreation, 340 p.

- Miller, M.G., 1976, Small Scale Mining in The South Shield Region of Eastern Ontario, prepared by Ministry of Culture and Recreation for MNR, 135 p.

- Historical Society publications and brochures.

- Topographic Map Series, (1:50,000).

- Canadian Inventory of Historic Buildings files, Parks Canada, Ottawa.

- Illustrated Historical Atlas's for the Counties of Leeds and Grenville (1861-62); Frontenac and Lennox-Addington (1878); Stormont, Dundas and Glengarry (1879); Carleton (1879); Lanark (1880).

- A Threshold Wilderness Concept for Frontenac Provincial Park, 1974, prepared by Hough, Stansbury and Assoc. Ltd. for the MNR, 57 p. + illustrations.

Archaeological

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- Pendergast, J.F., 1981, Potential Pre-Historic Archaeological Sites in The Ontario Hydro Eastern Ontario Route Stage Study Area, (unpublished), prepared for Ontario Hydro, 98 p.

Personal Contacts

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  Mark Fram - Heritage Planner
  Barbara McPhail - Heritage Planner
  Pamela Craig - Heritage Planner

  Ottawa

  Phillip Wright - Regional Archaeologist

Parks Canada (Cornwall)

John Bonser*	- Superintendent, Rideau Canal Office
Carl Peel	- Asst. Superintendent, Rideau Canal Office
Bill Stephenson	- Chief, Natural Resources
Elizabeth Snow	- Archaeology
Manual Stevens	- Planning
Ted MacDonald	- Restoration Architect
Ian Ferguson	- Planning
Dave Day	- Superintendent, Rideau Canal Office

Historical Societies

Mr. B. Dobson	- Smiths Falls Historical Society
Mr. O.A. Cooke	- Rideau Township Historical Society
Mrs. H.H. Roberts	- Rideau District Historical Society
Mrs. C. Grandmaison	- Rideau District Historical Society
and Ms. I. Trumpour	- Kingston Historical Society
Mrs. J.C. Burns	- The Historical Society of Ottawa
Mr. A.J. Cohoe	- Frontenac Historical Society
Mrs. G. Johnston	- Gloucester Historical Society
Mrs. E.L. Macartney	- Carleton, West-Russell Historical Society
Mr. G. Lockwood	- Ontario Historical Society
Ms. B. Sargeant	- Ontario Historical Society
____________________	- North Lanark Historical Society
Ms. V. Martyn	- Merrickville and District Historical Society
Mrs. J. Smithson	- Pittsburg Historical Society
____________________	- Carleton Place and Beckwith Historical Society
____________________	- Chaffey's Lock and Area Heritage Society
Ms. A.F. Battey-Pratt	- Frontenac Historic Foundation
Mr. B. Bowrin	- Goulbourn Township Historical Society
____________________	- Heritage Ottawa
____________________	- La Societe Franco-Ontarienne D'Histoire et Genealogie

City of Nepean

S.A. Curliffe	- Planning Department

Smiths Falls Museum Board

Mrs. J. Hogan

National Capital Commission (Ottawa)

R. Latte	- Interpretation and Heritage
A. Merriam	- Interpretation and Heritage

- Local Architectural Conservation Advisory Committee (LACAC)

Mr. H. Pragnell - Town of Almonte
Mrs. C. Flavell - Village of Bath
Mrs. G.S. Dickie - Town of Carleton Place
Mr. R.M. MacFarlane - Town of Gananoque
Ms. J. Oullahan - City of Kingston
Mr. R. Matthey - Village of Lanark
Mr. A. Connerty - Village of Merrickville
Mr. A. Capling - City of Nepean
Ms. N. Smith - City of Ottawa
Mr. K. Johnson - City of Gloucester
Mr. J. Peden - Town of Perth
Mrs. B. Humphreys - Township of Rideau
Mr. H. Nichol - Town of Smiths Falls
Mrs. D. Haskins - Township of South Crosby
- Township of Bastard and South Burgess
Mr. B. Bowin - Township of Goulbourn
Mr. B. Moore - Township of Goulbourn

Archaelogical

- Archaeological Consultant

James F. Pendergast - Merrickville, Ontario

B1.6 HUMAN SETTLEMENT

Data Types

(1) Existing Land Use (ERXLU)

- urban settlements - URBAN
- rural residential concentrations - RURAL
- non-urban commercial/industrial/institutional concentrations - NONUR
- airports and airfields - AIRPT
- areas of cottage concentrations - COTAG
- sewage lagoons, waste disposal sites, dumps, auto wrecking yards - WASTE
- communication towers (radio microwave, T.V., etc.) - TOWER

(2) Proposed Other Use (ERPOU)

- approved subdivisions - APROV
- pending subdivisions - PEND
- airport - AIRPT

(3) Linear Land Use (ERLLU)

- gas pipeline - GAS
- oil pipeline - OIL
- numbered highway - HWY
- railway - RAIL
- highway + railway - HWYR
- telephone lines - TELE
- telephone line + railway line - TERA
- telephone line + railway line + highway - TRH
- gas + telephone + railway - GTR
- gas + railway - GASR
- gas + highway - GASH
- gas + oil - GASO
- abandoned railway - ABRA
- railway + abandoned railway - RAAR
- abandoned railway + highway - HYAB
- telephone lines + highways - TEHW
- gas line + telephone lines - GAST
- oil line + railway - ORAI
- oil line + highway - HWYO

(4) Power Transmission Lines (ERPTL)

- power transmission lines - 115 kV or greater - LINE
- other lines - PTL

(5) Proposed Linear Land Use (ERPLU)

- proposed linear land use - PLLU

Data Sources and Contacts

Published and Unpublished Data

- Department of Highways County Maps, 1969, (1 inch = 2,645 ft)

  United Counties of Leeds and Grenville
  Regional Municipalities of Ottawa/Carleton - East and West Portions

- Ministry of Natural Resources, M-Series Maps, 1981, (1 inch = 40 chains).

  Hinchinbrooke
  Portland
  Loughborough
  Bedford
  Oso
  Palmerston
  Lavant
  Dalhousie
  Lanark
  Drummond
  Ramsay
  North and South Elmsley
  South Crosby
  Storrington

- Regional Municipality of Ottawa-Carleton Existing Land Use Map, 1981, prepared by the Planning Department, RMOC, for Ontario Hydro, (1:100,000).

- Regional Municipality of Ottawa-Carleton Proposed Land Use Map, 1981, prepared by the Planning Department, RMOC, for Ontario Hydro, (1:100,000).

- Zoning Map for Southern Ontario, Revised May, 1980, Ministry of Housing, (1:100,000).

- Official Plan Designations for Southern Ontario, Revised May, 1980, Ministry of Housing, (1:100,000).

- Minister's Zoning Orders for Southern Ontario, Revised May, 1980, Ministry of Housing, (1:100,000).

- Committees for Southern Ontario, Revised May, 1980, Ministry of Housing, (1:100,000).

- Municipal Official Plans:

  Bedford
  Central Rideau
  Ernestown
  Goulbourn
  Hinchinbrooke
  Kanata
  Kingston
  Lavant, Dalhousie,
   North Sherbrooke
  Loughborough
  Nepean
  North Lanark
  North Leeds
  Oso
  Ottawa-Carleton
  Palmerston
  Portland
  Rideau
  South Fredricksburg
  Storrington
  Tay Valley
  West Carleton

- Municipal Zoning By-laws:

  Bastard and South Burgess
  Bathurst
  Beckwith
  Bedford
  Drummond
  Hinchinbrooke
  Loughborough
  North Crosby
  South Crosby
  Montague
  Palmerston and North
   and South Canonto
  South Sherbrooke
  Storrington
  Ernestown
  Goulborne
  Kingston
  Kitley
  Lanark
  City of Nepean
  North Burgess
  Portland
  Ramsay
  Rideau

- Ministry of Housing, Subdivision Applications Files, 1976, 1977, 1978, 1979, 1980, 1981, 1982 and 1983.

- Subdivision Applications Maps, 31B-13, 31C-2, 31C-7, 31C-8, 31C-9, 31C-10, 31C-15, 31C-16, 31F-1, 31F-2, 31G-1, 31G-2, 31G-3, 31G-4, 31G-6, 31G-7, Ministry of Housing, (1:50,000).

- Sarnia to Montreal Extension Map, 1981, Interprovincial Pipe Line Limited.

- Toronto to Montreal to Ottawa Line Map, 1978, Trans Canada Pipelines, (1:50,000).

- Route Maps, Trans-Northern Pipe Line Company, 1975, (1:50,000).

  Drawing M/1644, Rev. 1, Montreal-Kingston
  Drawing M/1647, Kingston-Toronto
  Drawing M/1646, Farran's Point-Ottawa

- Ontario's Airports and Facilities Map, 1978-1979, Ontario Ministry of Transportation and Communications, (1:63,360).

- Ottawa/Gatineau Area Aviation Master Plan, 1980, prepared by Aviation Planning Services for Transport Canada.

- Gierman, D.M., 1976, Rural Land Use Changes in the Ottawa-Hull Urban Region, Ottawa, Lands Directorate, Environmental Canada, Ottawa, 85 p.

- Eastern Ontario Plan Stage Environmental Assessment, 1980, prepared by Ontario Hydro, 141 p. + appendices.

- Eastern Ontario Plan Stage Environmental Assessment, Public Involvement and Environmental Process Support Document, 1980, prepared by Ontario Hydro, 77 p. + appendices.

- Brockville District Land Use Strategy, Draft Strategy, 1982, prepared by the Brockville MNR, 66 p.

- Carleton Place District Land Use Strategy, Draft Strategy, 1982, prepared by the Carleton Place District, MNR, 67 p.

- Napanee District Land Use Strategy, Draft Strategy, 1982, prepared by the Napanee District, MNR, 74 p.

- Tweed District Land Use Strategy, Draft Strategy, 1982, prepared by the Tweed District, MNR, 56 p.

- Hopkins, P.S., 1980, Ontario Land Surveyor, County Map of Lennox and Addington, South Portion, Bath, Ontario.

- Regional Assessment Maps:

Bedford Township	1 inch = 2,640 feet, 1971
Ernestown Township	1 inch = 2,000 feet, 1971
Hinchinbrooke Township	1 inch = 2,640 feet, 1971
Loughborough Township	1 inch = 2,640 feet, 1971
Oso Township	1 inch = 2,000 feet, 1971
Palmerston Township	1 inch = 2,640 feet, 1972
Portland Township	1 inch = 2,000 feet, 1971

- Interpretation of 1979 Aerial Photographs, (1:30,000).

- Ontario Hydro, Listing of Municipal Planning Areas and Documents, 1981, and updated in 1983.

- Land Use in the Regional Municipality of Ottawa-Carleton Maps, 1975, prepared by the Planning Department, RMOC, (1:100,000).

- Topographic Map Series, (1:50,000).

- VFR Supplement, 1980, DND Flight Information Publ. GPH200A, Surveys and Mapping Br., Department of Energy, Mines and Resources, Ottawa, 130 p.

Personal Contacts

- Ministry of Housing

Queen's Park

Sharane Bellamy - Planner
Elizabeth Lea - Planner
Pat Sheppard - Planner
Michael Saunders - Planner
Linda Tennant - Planner
Estelita Segador - Technician

Regional Community Planning Advisory Branch (Ottawa)

Shane Kennedy - Manager
Glen Tunnoch - Planner
David Root - Planner
Dennis Jacobs - Planner
Wayne Belter - Planner

- Regional Municipality of Ottawa-Carleton

Barry Edgington - Senior Planner
Nigel Brereton - Manager, Rural Policy
Daniel Nixey - Planner
Gord Miller - Director, Plans Administration Division
Janet Babcock - Planner

- Ministry of Transportation and Communications

Regional Office (Kingston)

S. Radbone - Manager, Engineering & Right of Way Section
Tony Jones - Planning and Design Section

- Ministry of Natural Resources

Regional Office (Kemptville)

Bill Maslin - Regional Lands Coordinator
Bill Hiscock - Regional Planner

- Transport Canada (Toronto)

John Tron - Airports Group
Bob Rapier - Civil Aviation Group

- Regional Assessment Commissions

Lanark, Leeds and Grenville

J.L. Payne - Regional Assessment Commissioner

Ottawa-Carleton

G.H. Meridith - Regional Assessment Commissioner

Frontenac, Lennox and Addington

J.G. Ogilvie - Regional Assessment Commissioner

- Interprovincial Pipe Line Ltd. (Toronto)

R.J.C. Dunsmore - Manager, Right of Way Department, Eastern Division

- Trans Canada Pipelines (Toronto)

D.S. Hammond - Manager, Right of Way Department
W. Watt - Environmental Analyst

- Trans Northern Pipelines (Toronto)

Louis Robitaille - Right of Way Department

- National Capital Commission (Ottawa)

David Symons - Asst. Director, Intergovernmental Relations
Reg McLemore - Director, Planning Policy and Research
Aileen Merriam - Director, Interpretation

Stewart Hamill - Chief of Conservation
Shirley Black -
Don Lancaster - Surveys Branch

City of Gloucester

Mr. J. Reid - Planning Director

City of Kanata

Mr. D. Krajefsky - Planner

City of Nepean

Mr. B. Clark - Planner

City of Ottawa

Mr. E.M. Robinson - Division Head

Lanark County

Mr. K.I. Coulthart - Chief Administrative Officer

Bastard and South Burgess Township

Mrs. S. Bryden - Clerk

Beckwith Township

Ms. Y. Lawlor - Clerk-Treasurer

Bedford Township

Mr. W.D. Glover - Clerk
Mr. G. Thompson - Building Inspector

Drummond Township

Mr. J.M. McFarlane - Clerk
Mr. Westine - Building Inspector
Mrs. S. McConnell - Secretary

Goulbourn Township

Carla Maki* - Planner

Hinchinbrooke Township

Mrs. M. Howes

- Kingston Township

Mr. L. Thurston - Planner

- Kitley Township

Mr. C. Johnston - Clerk

- Lanark Township

Mrs. R. Mather - Clerk

- Lavant, Dalhousie and North Sherbrooke Township

Ms. E. Parsons - Assistant Clerk
Mrs. Kirkham - Clerk

- Loughborough Township

Mr. N. Orser - Clerk

- Montague Township

Mrs. V.A. Czaharynski

- North Burgess Township

Mrs. N. Bell - Clerk

- North Crosby Township

Mrs. B. Botting - Clerk
Mrs. S. Donnelly - Deputy Clerk Treasurer

- North Elmsley Township

Mr. D. MacFarlane - Clerk

- Oso Township

Miss. S. Donnelly

- Portland Township

Ms. D. Bracken

- Ramsay Township

Ms. M. Curry - Secretary
Mr. R.H. Brydges - Clerk

- South Crosby

  Mrs. M. Baxter - Clerk

- South Elmsley

  Mr. L. Hopper - Homeowner (at intersection of 115 kV line and Highway 29)

- South Elmsley Township

  Mr. D. Fergusson - Clerk
  Mr. W.J. Cox - Building Inspector

- South Sherbrooke Township

  Mrs. L. Van Alstine - Clerk

- Storrington Township

  Mr. S.G. Silver - Clerk

- West Carleton Township

  Ms. S. Grant - Planner

- Ontario Provincial Police

  Mr. T. Hillsburg - Corporal

- J.L. Richards and Associated Limited

  Mr. P. Hanna - Planner

- Property Owners

B1.7 MINERAL RESOURCES

Data Types

(1) Sensitive Soils (ERSS)

- routine geotechnical investigation necessary - 3
- detailed geotechnical investigation necessary - 4
- will require extensive remedial measures - 5
- unsuitable for construction - 6

(2) Unique Geologic Features (ERUGF)

- class 1 site - CL1
- class 2 site - CL2

- class 3 site - CL3
- class 11 site - CL11

(3) Existing Mineral Industries (ERXML)

- active and inactive surface and subsurface metallic and non-metallic mine sites - MINE
- active licenced and unlicenced pit sites - PIT, LPIT
- active licenced and unlicenced quarry sites - QUARY, LQURY
- iron mine sites - IRON
- marble mine sites - MARBL
- graphite mine sites - GRAPH
- phosphate mine sites - PHSTE
- mica mine sites - MICA
- lead mine sites - LEAD
- feldspar mine sites - FLDSR
- inactive pits and quarries - INACT

(4) Possible Sand and Gravel Reserves (ERPSG)

- possible sand and gravel reserves - PSGR

(5) Possible Industrial Mineral Reserves (ERPIM)

- marble - MARBL
- silica - SILCA

Data Sources and Contacts

Published and Unpublished Data

- Billings, M.D., 1975, Geological Sites and Features in the Regional Municipality of Ottawa-Carleton, prepared for the RMOC, 49 p. + appendices.

- Fletcher, T. and M. Klugman, 1979, Aggregate Assessment of the Regional Municipality of Ottawa-Carleton, MNR, 44 p.

- Klugman, M. and P. Chung, 1976, Slope Stability Study of the Regional Municipality of Ottawa-Carleton, OGS Misc. Paper MP68, 13 p.

- Ongley, E.D., 1965, A Study of Caves in Southern Ontario, BA thesis, University of Toronto, 117 p.

- Papertzian, C.R., 1980, A Compilation of Earth Science Data for the Provincial Parks Systems Plan, Eastern Admin. Region (1975, 1979, 1980), Div. of Parks, MNR, 63 p. + appendices.

- Mineral Aggregate Study and Geological Inventory - Part of the Eastern Ontario Region, 1975, prepared by Proctor and Redfern Ltd. and Gartner Lee Assoc., Ltd. for MNR.

- Sado, E.V., and M.A. Vos, 1976, Resources of Construction Aggregate in the Regional Municipality of Ottawa-Carleton, OFR 5218, Div. of Mines, MNR, 74 p.
- Mineral Resource Policies for Ottawa Carleton (Draft), 1981, prepared by RMOC, 25 p.
- Pit and Quarry License Applications, MNR District Offices.
- Mine Site Locations, compiled by the Assessment File Research Office, OGS, MNR.
- Leda Clay Survey Map (unpublished), prepared by the Eastern Regional Office, MNR, for the Carleton Place District.
- Mineral Report for Leeds and Grenville Counties (unpublished), Brockville District, MNR.
- Pit and Quarry Location Maps (unpublished), prepared by MNR District Offices, various scales and dates.
- Geologic and Aggregate Maps for the RMOC (unpublished), various scales and dates.
- Satterly, J., 1944, Mineral Occurrences in Lanark County, Ontario Dept. of Mines, Toronto, 195 p.
- Mineral Aggregate Resource Planning Policy (Approved Dec. 22, 1982), Ministry of Natural Resoures.
- Powell, R.D., and M.A. Klugman, 1979, Silica Sand Potential in Eastern Ontario, Prelim. Rpt. I, OGS, OFR 5265, 110 p. and attachments.
- Kingston, P., 1982, Industrial Mineral Opportunities in Eastern Ontario, paper presented at The 84th Annual General Meeting, Canadian Institute of Mining and Metallurgy, Quebec City, 11 p.
- Weatherson, G.L., 1982, Ontario Mineral Score, Video Census Series No. 1, MNR, Toronto, 338 p.
- Brockville District Land Use Strategy, Draft Strategy, 1982, prepared by the Brockville District, MNR, 66 p.
- Napanee District Land Use Strategy, Draft Strategy, prepared by the Napanee District, MNR, 74 p.
- Tweed District Land Use Strategy, Draft Strategy, 1982, prepared by the Tweed District, MNR, 56 p.

- Carleton Place District Land Use Strategy, Draft Strategy, 1982, prepared by the Carleton Place District, MNR, 67 p.
- MNR District Sensitive Area Reports
- MNR Preliminary Peat Maps, 1979, (1:50,000).
- NCC Land Use Map, 1974, (1:25,000).
- Topographic Map Series, (1:50,000).
- Interpretation of 1979 Aerial Photographs, (1:30,000).
- Municipal Official Plans and Zoning By-laws.
- Field Reconnaissance.

Personal Contacts

- Ministry of Natural Resources

Queen's Park (Toronto)

Hank Groen - Chief, Geoscience Data Centre, OGS
Gary Weatherson - Mineral Statistics Section
Dale Scott - Engineering Terrain Section

Regional Office (Kemptville)

Mike Klugman - Mines Co-ordinator
Tom Fletcher - Mineral Resources Manager
Anne Hinton* - Planner

District Offices

Brockville	- Paula Neice* - District Planner - Drew Young - Minerals Supervisor
Carleton Place	- Jim Bailey - District Manager - Peter Josephs* - District Planner - Mac MacDonald - Pits and Quarries Inspector - Terry McManus - Pits and Quarries Inspector - Daphne Hope - District Planner
Napanee	- Stu Thatcher - Minerals Supervisor - Brian Messerschmidt - Pits and Quarries Inspector
Tweed	- Marilyn Hyde* - District Planner - Paul Kingston - Resident Geologist

- Ministry of Transportation and Communications

  Regional Office (Kingston)

  Dave McAvoy - Environmental Analyst

- Property Owners

B1.8 RECREATION RESOURCES

Data Types

(1) Existing Recreation (ERXRC)

- federal parks - 1
- Rideau Canal locks - 15
- provincial parks - 2
- conservation areas/RMOC recreation-conservation areas - 3
- private parks and campgrounds/bible camps/scout camps - 4
- municipal parks - 44
- riding stable - 5
- ski club - 55
- rifle range/skeet club - 6
- access point to water - 7
- tent or trailer park - 8
- stadiums/arenas - 9
- fairgrounds - 10
- speedways - 10A
- resorts, commercial cottages - 11
- golf courses - 12
- trout farms/fish santuaries - 13
- historic sites - 14
- conservation authority-reforestation area - 32

(2) Proposed Recreation (ERPRC)

- provincial park reserves - 2
- conservation authority reserves/proposed regional park - 3

(3) Special Interest Roads (ERSIR)

- Highway 7 - R1
- Lanark County Byways - R2
- Perth Road - R3
- Highway 401 - R4
- Battersea Road - R6

(4) Hiking Trails (ERHT)

- Rideau Trail - RIDAU
- rest areas along Rideau Trail - RREST

- Manion Marsh Trail - MNIOM
- Murphy's Point Trail - MP
- Frontenac Park Trail - FRONT
- rest areas along Frontenac Park Trail - FREST

(5) Snowmobile Trails (ERST)

- snowmobile trails - SNOWT

(6) Ski Trails (ERSKI)

- ski trails - SKIT
- Pine Grove Trail - PGROV
- Mer Bleue Trail - MBLEU
- Pinhey Trail - PINEY
- Stony Trail - STONY

(7) Canoe Routes (ERCRT)

- designated or high priority canoe routes - navigable in most conditions - C1
- intermediate priority canoe routes - navigable in most conditions - C3
- low priority canoe routes - difficult in low water - C4

(8) Viewsheds of Special Interest Roads (ERVSR)

- Trans Canada Highway 7 - TCHY7
- Perth Road - PERTH
- Battersea Route - BATRD
- Lanark County Byways - Tour No. 2 - LBT2
- Lanark County Byways - Tour No. 3 - LBT3
- Lanark County Byways - Tour No. 4 - LBT4
- Lanark County Byways - Tour No. 5 - LBT5
- overlap - Highway 7 and Lanark County Byway - Tour No. 4 - OH7B4
- overlap - Highway 7 and Lanark County Byway - Tour No. 2 - OH7B2
- overlap - Lanark County Bayway - Tours No. 1 and 2 - OB1B2
- overlap - Lanark County Byway - Tours No. 2 and 3 - OB2B3
- overlap - Lanark County Byway - Tours 2 and 4 - OB2B4
- overlap - Lanark County Byway - Tours No. 3 and 4 - OB3B4
- overlap - Lanark County Byway - Tours No. 4 and 5 - OB4B5
- overlap - Lanark County Byway - Tour No. 5 and Perth Road - OB5PR
- Highway 2 - TCHY2

(9) Viewsheds of Designated Canoe Routes (ERVCR)

- viewsheds of designated canoe routes - VDCRT

(10) Viewsheds of Scenic Interest Areas (ERSIA)

- primary viewsheds - PRVWM
- secondary viewsheds - SEVWM

Line
Numbers

Data Sources and Contacts

Published and Unpublished Data

- Canoe Routes of Ontario, 1981, Ontario MNR Publ. No. 5835, McClelland and Stewart Ltd., Toronto, 110 p.
- Ontario Recreation Supply Inventory - Tourism and Outdoor Recreation Planning Study, Users Manual, 1975, Parks and Recreational Areas Branch, MNR, 14 p. + appendices.
- Ontario Recreation Supply Inventory - computer output by township and county, + associated maps, (1:50,000).
- Tourism Development Opportunities: Trenton-Cornwall Zone, Renfrew-Kingston Zone, nd, prepared by De Leuw Cather (Canada) Ltd. for the Ontario Ministry of Industry and Tourism, 88 p. + appendices.
- Preliminary Evaluation of Ontario Waterways for Provincial Park Purposes, 1980, Parks and Recreational Areas Branch, MNR, 82 p.
- Ottawa Valley Parkway, 1974, prepared by Hough, Stansbury and Assoc. Ltd. for the Ontario Ministry of Industry and Tourism, 57 p. + appendices.
- Conservation Authority - annual reports, brochures, maps
    - Cataraqui Region Conservation Authority
    - Mississippi Valley Conservation Authority
    - Napanee Region Conservation Authority
    - Rideau Valley Conservation Authority
- Parks Canada, various publications, brochures, policy statements, and property maps, (1:4,800).
- CORTS, policy statements and pamphlets.
- Ontario Ministry of Natural Resources, various brochures and maps.
- A Method for Determining the Recreational Impact of High Voltage Transmission Lines for Ontario Hydro (Draft), 1982, prepared by Landplan Collaborative Ltd. for Ontario Hydro.
- Lanark County By-way Tour No. 1-5, nd, prepared by the Lanark County Tourism and Promotion Committee, Perth, Ontario.
- Brockville District Land Use Strategy, Draft Strategy, 1982, prepared by the Brockville District, MNR, 66 p.
- Carleton Place District Land Use Strategy, Draft Strategy, 1982, prepared by the Carleton Place District, MNR, 67 p.

- Napanee District Land Use Strategy, Draft Strategy, 1982, prepared by the Napanee District, MNR, 74 p.
- Tweed District Land Use Strategy, Draft Strategy, 1982, prepared by the Tweed District, MNR, 56 p.
- Regional Municipality of Ottawa-Carleton (RMOC) Map, Regional Forest - West Rideau Township - Hiking Trails, 1978, (1:50,000).
- RMOC, various brochures and publications.
- A Threshold Wilderness Concept for Frontenac Provincial Park, 1974, prepared by Hough Stansbury and Assoc. Ltd. for the MNR, 57 p. + illustrations.
- National Capital Commission (NCC), various brochures and policy statements.
- NCC Winter Trails Maps, 1979, (1:25,000).
- NCC Greenbelt Map, 1974, (1:25,000).
- Conservation Lands in Ottawa-Carleton, Background Reports 1-5, 1976, prepared by the Planning Department, RMOC.
- Conservation Lands in Ottawa-Carleton, River Corridors and Conservation Areas Project, 1977, prepared by the Planning Department, RMOC, 74 p. + technical appendix.
- Conservation Lands in Ottawa-Carleton, Briefs and Letters and Record of Public Hearings, Vol. 1-8, 1978, prepared by the Planning Department, RMOC.
- Topographic Map Series, (1:50,000).
- Interpretation of 1979 Aerial Photographs, (1:30,000).
- Field Reconnaissance.

Personal Contacts

- Ministry of Natural Resources

Queen's Park (Toronto)

Doug Driscoll - Parks Branch
Paula Warwick - Land Use Co-ordination Branch
Ken McCleary - Parks Branch

Regional Office (Kemptville)

Susan Cramp - Parks Branch Co-ordinator
Don Cuddy - Parks Branch

District Offices

Brockville

- Paula Neice* - District Planner
- Ted Devries - Recreation Planner

Carleton Place

- Daphne Hope - District Planner
- Peter Josephs* - District Planner
- Paul Wooton - District Parks Co-ordinator
- Ken Schonauer - Parks Supervisor
- Robin Rogers - Lands Supervisor

Napanee

- Terry Eccles - Senior Lands Technician
- Peter Josephs* - District Planner
- Chuck Matheson - Parks Supervisor
- Karl Montgomery* - Assistant Park Superintendent-Frontenac P.P.

Tweed

- Marilyn Hyde* - District Planner
- Floyd Caverley* - Lands Supervisor
- Gary Sharmen - Assistant Park Superintendent - Bon Echo P.P.

Ministry of Tourism and Recreation

Queen's Park (Toronto)

Judy Langer

Ministry of Transportation and Communication

Regional Office (Kingston)

Dave McAvoy - Environmental Analyst

Cataraqui Region Conservation Authority (Glenburnie)

Warren Mills - Planner
Roy Rogers - Superintendent
Judy Brouse - Assistant Planner

Mississippi Valley Conservation Authority (Lanark)

Andy Burt - Manager
Sandy Hay - Planning Supervisor
Susan Merkley - Technical Supervisor

- Napanee Region Conservation Authority (Napanee)

Bev Smith* - Planner
Edgar Adams - Water REsources Technician

- Rideau Valley Conservation Authority (Manotick)

Cliff Craig - Planner

- Regional Municipality of Ottawa-Carleton

Nigel Brereton - Manager, Rural Policy
Daniel Nixey - Planner

- Parks Canada (Cornwall)

William Stephenson - Chief, Natural Resources

- Rideau Canal Office (Smiths Falls)

John Bonser - Superintendent
Carl Peel - Assistant Superintendent
Al Hickman - Realty Agent

- CORTS (Peterborough)

Peter White - Director, Policy and Program Coordination

- Hewlett - Packard (Canada) Ltd (Kingston)

Karl Montgomery - Site Administrator

- National Capital Commission (Ottawa)

Alan Ede - Director, Parks and Public Activities

- Property Owners

B1.9 ENGINEERING/COST CONSTRAINTS

(1) Water Bodies (ERWTR)

- Rideau - RIDAU
- Mississippi - MISSI
- lakes - LAKES

(2) Rivers (ERRVR)

- rivers - RIVER

(3) Sensitive Soils (ERSS)

- routine geotechnical investigation necessary - 3
- detailed geotechnical investigation necessary -4
- will require extensive remedial measures - 5
- unsuitable for construction - 6

(4) Landslide Areas (ERLA)

- slide areas - SLIDE

(5) Unique Geologic Features (ERUGF)

- class 1 site - CL1
- class 2 site - CL2
- class 3 site - CL3
- class 11 site - CL11

Data Sources and Contacts

Published and Unpublished Data

- Billings, M.D., 1975, Geological Sites and Features in the Regional Municipality of Ottawa-Carleton, prepared for the RMOC, 49 p. + appendices.

- Klugman, M. and P. Chung, 1976, Slope Stability Study of the Regional Municipality of Ottawa-Carleton, OGS Misc. Paper MP68, 13 p.

- Ongley, E.D., 1965, A Study of Caves in Southern Ontario, BA thesis, University of Toronto, 117 p.

- Papertzian, C.R., 1980, A Compilation of Earth Science Data for the Provincial Parks Systems Plan, Eastern Admin. Region (1975, 1979, 1980), Div. of Parks, MNR, 63 p. + appendices.

- Leda Clay Survey Map (unpublished), prepared by the Eastern Regional Office, MNR, for the Cornwall and Carleton Place Districts.

- MNR District Sensitive Area Reports.

- CORTS, various brochures, pamphlets and policy statements.

- Topographic Map Series, (1:50,000).

- Interpretation of 1979 Aerial Photographs, (1:30,000).

- Field Reconnaissance.

Personal Contacts

- CORTS (Peterborough)

  Peter White - Director, Policy and Program Coordinator

- Parks Canada (Cornwall)

  Wm. Stephenson - Chief, Natural Resources

- Rideau Canal Office (Smith's Falls)

  John Bonser - Superintendent
  Carl Peel - Assistant Superintendent

- Ministry of Natural Resources

  Regional Office (Kemptville)

  Mike Klugman - Mines Co-ordinator
  Tom Fletcher - Mineral Resources Manager
  Anne Hinton* - Planner

B1.10 POLITICAL FABRIC

(1) County Boundaries (ERCYB)

- Frontenac - FRNTC
- Lanark - LANRK
- Leeds - LEEDS
- Lennox and Addington - LENAD

(2) Townships (ERTWP)

Bastard and South Burgess
Bathurst
Beckwith
Bedford
Dalhousie
Drummond
Ernestown
Goulbourn
Hinchinbrooke
Kingston
Kitley
Lanark
Lavant
Loughborough
Montague
North Burgess
North Crosby
North Elmsley
North Sherbrooke
Oso
Palmerston
Portland
Ramsay
Rideau
South Crosby
South Elmsley
South Fredericksburg
South Sherbrooke
Storrington
West Carleton

(3) City Limits (ERCTY)

Ottawa - OTAWA
Perth - 1
Westport - 1
Stittsville - 1
Richmond - 1
Nepean - NPEAN
Kanata - KANTA
Gloucester - GLSTR
Kingston - KINGN
Smiths Falls - 1
Bath - 1
Napanec - 1
Newburgh - 1
Newboro - 1
Gananoque - 1
Lanark - 1
Carleton Place - 1
Almonte - 1

(4) Planning Areas (ERGPA)

Lennox and Addington - LENAD
Kingston - KINGS
Portland - PORTD
Loughborough - LOUGH
Storrington - STORN
Bedford - BEDFD
Hinchinbrooke - HINCH
Oso - OSO
Palmerston - PALMN
Lavant Dalhousie and North Sherbrooke - LAVNT
Tay Valley - TAY
North Leeds - LEEDS
Central Rideau - RIDAU
North Lanark - LANRK
Reg. Mun. of Ottawa-Carleton - OTTCH

(5) National Capital Commission (ERNCC)

- National Capital Commission - NCC

(6) Land Tenure (ERLTN)

- Crown land - 1
- Federal land (DND, NCC, Agr. Can., DEMR, Parks Canada, Dept. of Transport) - FEDLD
- Conservation authority land - CONLD
- Provincial park land - PROLD
- Municipal land - MUNLD

(7) Concession Lines (ERCON)

- concession lines - CON

Published and Unpublished Data

Data Sources and Contacts

- Provincial Ministries: Housing
  M.T.C. (county maps)
  M.N.R. (administration maps)

- Area Planning Boards
- Official Plans
- County Clerks/Town Clerks
- R.M.O.C.
- Topographic Map Series, (1:50,000)

Personal Contacts

Rideau Canal Office (Smiths Falls)

Al Hickman - Realty Agent

APPENDIX B2

OBJECTIVE STATEMENT
FORMAT AND CRITERIA

Line Numbers

OBJECTIVE

To avoid a geographically defined land use or environmental "situation".

DESCRIPTION

The data types used to define the situation are described, and the general location, extent, or percentage occurrence in the study area is outlined.

RESOURCE VALUE

This section describes the importance of each situation to the local and/or regional land use or resource base (including economic, social, bio-physical and aesthetic considerations).

The importance of the resource can be described in terms of:

> Significance: of the situation to the land use and/or resource base (varies according to officially stated policies or regulations, and/or bio-physical quality);
>
> Prevalence: of the situation in a local and/or regional context (varies according to its pattern of occurrence, relative abundance or scarcity, its availability or accessibility, its ownership or regulation);
>
> Sensitivity: of the situation to change, or to resist change (varies according to the assessment of "risk" of adverse effect on the present condition of the situations, the necessity or desirability to maintain the present or future state of the situations, and the degree of maintenance required to do so);
>
> Interrelationships: among situations, as they pertain to the condition-action-response relationships in the environment (includes a holistic assessment of interrelationships among resources, officially stated or approved land use policies or regulations and the land use infrastructure).

POSSIBLE EFFECTS

This section describes the magnitude of physical or perceptual changes to situations that may occur through related transmission line development activities.

The magnitude of the possible effects can be described in terms of:

> Type: of possible effects resulting from a proposed action, either a direct effect on the land use or environmental characteristics, or an indirect effect on secondary characteristics or processes (direct or indirect). This includes contravention of officially stated or approved land use policies or regulations;
>
> Extent: of possible effects (spatially), confined to the immediate area or wide spread (on-site and/or off-site).

Intensity: of possible effect on each environmental situation (low, moderate, or high degree of change);

Duration: of possible effects over time (short or long term);

Frequency: of possible effects as a result of one or more repetitions of a construction event, or by multiple events (single or cumulative effects);

Probability: of possible effect on each environmental situation (low, moderate or high risk of effect).

POSSIBLE MITIGATION

This section identifies, in general terms, the measures that Ontario Hydro could apply to avoid or to minimize anticipated impacts if the situation cannot be avoided.

The possible mitigation measures can be described in terms of:

Reversibility: of possible effects over time and space, either through natural restoration of a balance between forms and process, or through implementation of vegetative and/or structural remedial measures;

Other: planning activities that have an influence on possible effects, such as timing construction activities with the seasons of the year, applying construction techniques which minimize effects (see: Construction and Site Restoration Guidelines for Transmission Facilities, 1981, prepared by Ontario Hydro, 67 p.), or changing land use policies or regulations.

APPENDIX B3

ENVIRONMENTAL FACTORS AND OBJECTIVES

B3.1 Agricultural Resources

1. Specialty crop production areas and CLI soil capability class 1 in agriculture
2. CLI soil capability classes 2, 3 in agriculture
3. CLI soil capability class 4 in agriculture
4. CLI soil capability classes 5, 6 in agriculture

B3.2 Appearance of the Landscape

1. Landscapes characterized by high hills
2. Viewsheds of existing settlements
3. Landscapes characterized as hilly
4. Ridge farm landscapes

B3.3 Biological Resources

1. Biological areas considered to be rare, unique, sensitive or significant
2. Biologically significant wetlands
3. Fish and wildlife protection/management areas
4. Deer winter concentration areas
5. Cold and warm water fisheries
6. Waterfowl habitat
7. Wetlands with no identified biological information

B3.4 Forest Resources

1. Experimental forest areas and maple sugar bush operations
2. Intensive management forest areas
3. Productive forest lands with valuable species of mature or all-aged stands
4. Productive forest lands with valuable species of immature or young stands
5. Productive forest lands with intermediate value, and low value species of all ages

B3.5 Heritage Resources

1. Confirmed archaeological sites and known historical routes and sites
2. Potential archaeological sites and areas
3. Representative cultural landscapes that exemplify settlement patterns or land use practices

B3.6 Human Settlement

1. Existing urban settlements
2. Existing rural strip developments and cottage developments
3. Existing institutional, commercial and industrial facilities
4. Approved residential and cottage developments

B3.7 Mineral Resources

1. Active quarries
2. Active pits
3. Geologic sites and features with recognized value
4. Areas of high sand and gravel reserve and industrial mineral potential

B3.8 Recreation Resources

1. Federal, provincial and conservation area parks
2. The viewshed of the Rideau Canal System and Westport Mountain
3. Existing private, commercial and public recreation facilities
4. Viewsheds of cottage lakes
5. Viewsheds of designated linear recreation features
6. Provincial park and conservation area reserves

B3.9 Engineering/Cost Constraints

1. Lakes and major navigable waterways
2. Sensitive/unique geologic features

B3.1 AGRICULTURAL RESOURCES

B3.1.1 AGRICULTURAL RESOURCES I

OBJECTIVE

Avoid areas with existing specialty crop production and areas with Canada Land Inventory (CLI) soil capability class 1 in agricultural land use.

DESCRIPTION

Areas presently used for specialty crop production are very limited within the study area.

CLI class 1 soils generally have no limitations to crop growth and, hence, are considered to be the most productive soils.

The agricultural land (excluding specialty crops) within the study area has been identified under the following agricultural land use systems: monoculture (continuous cultivation of corn or cereal grains), corn (40 to 90 percent corn with hay cereal grains and pasture in rotation), mixed (less than 40 percent corn with hay, cereal grains and pasture in rotation), hay (rotation of hay, cereal grains and pasture, largest proportion hay), pasture (hay and pasture in equal quantities) and grazing (permanent pastures with small portion of hay).

This situation occupies approximately three percent of the west section.

RESOURCE VALUE

- The scarcity of specialty crop areas in eastern Ontario makes them a regionally significant resource. Specialty crop farm units are generally small in the study area and high value per acre crops are grown.

- Tender fruit and vegetable growing areas are given highest priority for preservation in the Ontario Food Land Guidelines (1978), which outline Ontario's agricultural planning policy.

- CLI class 1 soils are the best soils for sustained cultivation of common field crops, and are given high priority for preservation in the Ontario Food Land Guidelines.

- Farm operations within this objective contribute significantly to the economic stability of their support services through the purchasing of machinery, fertilizers, herbicides, etc.

POSSIBLE EFFECTS

- Transmission facilities located in specialty crop areas and productive agricultural land may conflict with provincial agricultural planning policies.

Line Numbers

- The presence of towers in agriculture areas may affect the farming practices required to grow high value crops. For example, towers may reduce the operational efficiency or restrict the use of specialized machinery associated with specialty crops (i.e. high pressure irrigation, aircraft operations, specialized harvesting equipment). Land may be lost from production under, and adjacent to towers. The prevalence of row crops (i.e. corn) on CLI class 1 soils, and the large size of machinery associated with its cultivation may create problems in maneuvering machinery around towers without damaging the machinery or the crop being grown.

- Construction activities may lead to soil compaction and rutting. This can cause a temporary reduction in crop yield along access roads and near tower sites; depending on soil conditions at the time of construction.

- There may be loss of, or damage to, fruit trees and crops during construction.

POSSIBLE MITIGATION

- Locate towers along property lines, adjacent to, or straddling fence rows to minimize the land lost from production.

- Avoid or minimize crossings of subsurface drainage systems to prevent damage to drainage tiles from soil compaction. Ontario Hydro will repair tiles broken during construction (see: Construction and Site Restoration Guidelines for Transmission Facilities, 1981, prepared by Ontario Hydro, 67p.).

- Reduce soil compaction and rutting through the following measures:

    - time construction activities on sensitive soils (i.e. organics) to frozen or dry soil conditions when the load bearing capacity is the greatest.

    - use filter fabric and gravel for access road construction which can be completely removed after construction.

    - use construction equipment designed to exert minimum ground pressure.

    - stop construction when soil conditions are most unstable.

    - use existing farm lanes or roadways for access, and limit access road width to minimize loss of standing crop and soil compaction.

    - treat access roads and area around tower sites to loosen compacted soils.

B3.1.2 AGRICULTURAL RESOURCES 2

OBJECTIVE

Avoid land with Canada Land Inventory (CLI) soil capability classes 2 and 3 in agricultural land use.

DESCRIPTION

CLI soil capability classes 2 and 3 are prime soils for sustaining production of common field crops.

The agricultural land within the study area has been identified under the following agricultural land use systems: monoculture (continuous cultivation of corn or cereal grains), corn (40 to 90 percent corn with hay cereal grains and pasture in rotation), mixed (less than 40 percent corn with hay, cereal grains and pasture in rotation), hay (rotation of hay, cereal grains and pasture, largest proportion hay), pasture (hay and pasture in equal quantities) and grazing (permanent pastures with small portion of hay).

Land with soil capability classes 2 and 3 in agricultural land use represents approximately nine percent of the west section.

RESOURCE VALUE

- CLI soil capability classes 2 and 3 are prime soils for sustained cultivation of common field crops. The Ontario Food Land Guidelines (1978) consider CLI class 2 and 3 soils as high priority agricultural lands for preservation.

- Farm operations within this objective contribute significantly to the economic stability of their support services through the purchasing of machinery, fertilizers, herbicides, etc.

POSSIBLE EFFECTS

- Transmission facilities located on high capability agricultural lands may conflict with provincial agricultural planning policies.

- The presence of towers in agricultural areas may affect farming practices. The hydro towers may reduce the operational efficiency or restrict the use of machinery around the tower bases, thereby increasing the cost of normal field operations. Land may be lost from production under, and adjacent to towers. The prevalence of row crops (i.e. corn) on the aforementioned soil capability classes, and the large size of machinery associated with its cultivation may create problems in maneuvering machinery around towers without damaging the machinery or the crop being grown.

- Construction activities may lead to soil compaction and rutting. This can cause a temporary reduction in crop yield along access roads and near tower sites and can damage sub-surface drainage, depending on soil conditions at the time of construction.

- There may be a loss of standing crops during construction.

POSSIBLE MITIGATION

- Locate towers along property lines, adjacent to, or straddling fence rows to minimize the land lost from production.

- Reduce soil compaction and rutting through the following measures:

- time construction activities on sensitive soils (i.e. organics) to frozen or dry soil conditions when the load bearing capacity is the greatest.

- use filter fabric and gravel for access road construction which can be completely removed after construction.

- use construction equipment designed to exert minimum ground pressure.

- stop construction when soil conditions are most unstable.

- use existing farm lanes or roadways for access, and limit access road width to minimize loss of standing crop and soil compaction.

- treat access roads and area around tower sites to loosen compacted soils.

B3.1.3 AGRICULTURAL RESOURCES 3

OBJECTIVE

Avoid land with Canada Land Inventory (CLI) soil capability class 4 in agricultural land use.

DESCRIPTION

CLI soil capability class 4 is generally best suited for perennial forages but is marginal for common field crops. It may or may not be tile drained.

The agricultural land use systems are described in Agricultural Resources 2.

This situation represents approximately three percent of the west section.

RESOURCE VALUE

- Although class 4 soils are not generally best suited for corn or cereal grain production, in some areas crop growth may be enhanced by soil management techniques initiated by the farm operator (i.e. tile drainage). This potential for increase in soil productivity is recognized.

- The Ontario Food Land Guidelines identify class 4 soils, and any lands exhibiting ongoing viable agriculture, as high priority agricultural land for preservation.

- These areas contribute to the economic stability of the agricultural support services; i.e. machinery dealers, feed stores, fertilizer and chemical suppliers.

POSSIBLE EFFECTS

- Same as Agricultural Resources 2, except that forage crops are prevalent rather than row crops.

- There may be less land lost from production, or potential crop damage during harvesting, because of better farm machinery maneuverability with forage crops.

POSSIBLE MITIGATION

- Same as Agricultural Resources 2.

B3.1.4 AGRICULTURAL RESOURCES 4

OBJECTIVE

Avoid land with Canada Land Inventory (CLI) soil capability classes 5 and 6 in agricultural land use.

DESCRIPTION

CLI soil capability classes 5 and 6 are generally best suited for perennial forage crops.

The agricultural land use systems are described in Agricultural Resources 2.

This situation represents approximately seven percent of the west section.

RESOURCE VALUE

- Class 5 and 6 soils provide forages for livestock production on many farms, and because they may be incorporated with the better quality cultivated soils they are often an important component of a farming operation.

- The Ontario Foodland Guidelines describe areas where farms exhibit characteristics of ongoing viable agriculture as priority agricultural lands for preservation.

POSSIBLE EFFECTS

- Same as Agricultural Resources 3; but there is less actively cultivated land or tile drainage areas possibly affected.

POSSIBLE MITIGATION

- Same as Agricultural Resources 2.

B3.2 APPEARANCE OF THE LANDSCAPE

B3.2.1 APPEARANCE OF THE LANDSCAPE 1

OBJECTIVE

Avoid landscapes that are characterized by high hills.

Line Numbers

DESCRIPTION

This situation includes landscapes which have hills with more than 150 ft (50 m) of relief. These landscapes are forested and have very prominent crests.

There are several high hills near the west side of the west section, including areas such as Lavant Mountain.

This situation occupies two percent of the west section.

RESOURCE VALUE

- Landscapes characterized by high hills are rare within the study area and have limited access.

- This type of landscape is often preferred for viewing because of the potential for long and panoramic views.

- These areas are very sensitive to visual changes induced by the presence of tower lines because of the high occurrence of prominent crests.

POSSIBLE EFFECTS

- The transmission line may be visible from a distance. The intensity of these effects would be greater if transmission facilities were located on crests and higher slopes. The intensity of the effects of towers located in low areas would be moderate to low.

- The removal of vegetation from forested areas may result in a colour contrast between the right of way and the surrounding vegetation. This contrast would be most pronounced in the winter.

- The presence of the towers may result in a contrast with the natural elements in terms of scale and character and may, therefore, represent a high degree of change to the landscape.

POSSIBLE MITIGATION

- The contrast between the cleared right of way and forested areas will be reduced by allowing natural regeneration of compatible species on the right of way.

B3.2.2 APPEARANCE OF THE LANDSCAPE 2

OBJECTIVE

Avoid the viewsheds of existing settlements.

Line
Numbers

DESCRIPTION

Only the primary viewsheds of cities, towns, villages, and concentrations of rural residential areas (as identified by the Human Settlement factor) are considered. In flat, untreed landscapes, two kilometres was used as the dividing line between primary and secondary viewsheds. Beyond a distance of two kilometres, it was felt that a transmission line ceased to be significant in terms of its effect on viewers.

The viewsheds in Shield areas tend to be small, defined by crests in the middleground, and scattered along the main roads. The viewsheds in agricultural areas are generally larger, often overlap between centres, and are defined by trees in the distant background.

These viewsheds incorporate the majority of the population in the study area.

This situation occupies approximately nine percent of the west section.

RESOURCE VALUE

- These viewsheds are moderately to highly sensitive to visual intrusion into the "personal space" of the community, and reflect the concern about the effects of transmission lines on people's homes.

POSSIBLE EFFECTS

- The tower lines may be visible for long distances.

- The removal of vegetation may result in a colour contrast between the right of way and the surrounding vegetation. This colour contrast is most pronounced during the winter.

- The presence of the towers may result in a contrast with natural elements in terms of scale and character.

POSSIBLE MITIGATION

- The contrast between the cleared right of way and forested areas will be reduced by allowing natural regeneration of compatible species on the right of way.

B3.2.3 APPEARANCE OF THE LANDSCAPE 3

OBJECTIVE

Avoid landscapes that are characterized as hilly.

DESCRIPTION

These landscapes have hills that range between 30 m and 50 m (100 ft. to 150 ft.). The landscapes are located mostly on-Shield, with those off-Shield being less densely forested. These landscapes are characterized by hills that are distinct and have prominent crests.

This situation occupies about twelve percent of the west section.

RESOURCE VALUE

- These areas offer many opportunities for "scenic" viewing and provide a good visual record of typical Shield landscapes. The off-Shield landscapes contrast strongly with their surrounding landscapes, thereby creating heightened viewer awareness.

- These situations are sensitive to visual changes because of the high occurrence of prominent crests.

POSSIBLE EFFECTS

- Same types of possible effects as Appearance of the Landscape 1, but the intensity of effects would be less.

POSSIBLE MITIGATION

- Same as Appearance of the Landscape 1.

B3.2.4 APPEARANCE OF THE LANDSCAPE 4

OBJECTIVE

Avoid ridge farm landscapes.

DESCRIPTION

These farm landscapes tend to be long and narrow, running mostly north/south. They contrast strongly with the flat wetlands that surround them. They are located in the northwestern portion of the study area.

This situation represents about two percent of the west section.

RESOURCE VALUE

- These areas represent a type of landscape that is topographically distinctive within the study area.

- These landscapes are moderately sensitive to visual change.

POSSIBLE EFFECTS

- The transmission line may be visible from a distance. If a tower line paralleled the ridge, on the crest, then all of the towers would be skylined. These effects could extend over a very wide area. The intensity of each of these effects will vary according to site conditions, but the effects would be very long term.

- The removal of vegetation may result in a colour contrast between the right of way and the surrounding vegetation. This colour contrast would be most pronounced during the winter.

- The presence of the towers may result in a contrast with natural elements in terms of scale and character.

POSSIBLE MITIGATION

- The line may be partially screened by allowing natural regeneration of compatible species on the right of way.

B3.3 BIOLOGICAL RESOURCES

B3.3.1 BIOLOGICAL RESOURCES 1

OBJECTIVE

Avoid biological areas considered to be rare, unique, sensitive or significant.

DESCRIPTION

This situation includes areas with rare/unusual plants, such as the ram's head lady slipper; unique wildlife habitat, such as nesting sites for herons, eagles and ospreys; and sensitive fish spawning habitat.

This situation represents about five percent of the west section.

RESOURCE VALUE

- The identified floral and faunal species represent unique combinations of characteristics which are very sensitive to changes.

- These resources provide unique opportunities for visual and educational experiences and scientific research.

- Protection of rare/unusual flora and/or fauna, and associated habitat, is becoming increasingly important to many government agencies and interest groups throughout Ontario. Many of these floral and faunal species are protected under the Endangered Species Act.

- The habitats associated with these species are necessary to sustain population levels.

POSSIBLE EFFECTS

- Transmision facilities located in sensitive biological areas may conflict with existing legislation.

- Right of way clearing and construction activities may result in the removal of sensitive floral species. As a result, there may be permanent loss of unique and irreplaceable species and habitat considered biologically important to protect. This may encourage the influx of more aggressive and competitive species, or reduce the carrying capacity of the habitat.

- Construction activities during critical periods in the species annual cycle may adversely affect such activities as breeding, nesting, and spawning.

- There may be an alteration in known ecological diversity, which cannot otherwise be duplicated.

- Right of way clearing and access road construction may facilitate increased human pressure upon the rare, unique, sensitive or significant biological areas.

POSSIBLE MITIGATION

- Time construction and maintenance activities to avoid critical periods in the species annual cycle.

- Survey the ROW prior to construction to identify precise locations of these features, and avoid or protect these sites during construction.

- Utilize structural control devices where a vegetative buffer adjacent to aquatic habitats (spawning beds) is insufficient to minimize sedimentation during construction.

B3.3.2 BIOLOGICAL RESOURCES 2

OBJECTIVE

Avoid biologically significant wetlands.

DESCRIPTION

Wetlands represent areas that are seasonally or permanently covered by standing water to a depth not greater than two metres.

Significant wetlands include those with known multiple representative species and/or habitat not previously identified in Biological Resources 1.

This situation occupies two percent of the west section.

RESOURCE VALUE

- Biologically significant wetlands have a high educational value because of the diversity of floral and faunal species present.

- Wetlands contribute to the maintenance of water quantity and quality conditions due to their function as natural water storage reservoirs, filters and regulators of stream flow.

- Biologically significant wetlands are diminishing rapidly as a result of competition with other land uses, thereby making those still remaining more significant.

- Biologically significant wetlands in the study area are reasonably natural and forest covered.

POSSIBLE EFFECTS

- Right of way clearing and construction activities may necessitate the removal of vegetative species or habitat considered biologically significant. This may encourage the influx of more aggressive and competitive species, or reduce the carrying capacity of the habitat.

- There may be an alteration of known ecological diversity, which cannot otherwise be duplicated.

- Right of way clearing and construction activities may slightly alter the hydrologic conditions of the wetlands.

- Right of way clearing and access road construction may facilitate increased human pressure upon significant wetlands.

POSSIBLE MITIGATION

- Construction effects may be minimized by timing construction for frozen soil conditions, and/or using corduroy or gravel roads.

- Store fuels, lubricants, etc., to service equipment off-site.

- Use tower extensions to maximize retention of vegetation.

B3.3.3 BIOLOGICAL RESOURCES 3

OBJECTIVE

Avoid all areas established for the protection and/or management of fish and wildlife.

DESCRIPTION

These areas have been established by regulatory government agencies at the provincial and federal levels. Most are managed by the Ministry of Natural Resources (MNR). This situation includes:

- wildlife and waterfowl management areas
- nature reserves
- fish hatchery/trout farm
- scientific research areas
- federal bird sanctuary
- fish sanctuaries

This situation occupies approximately four percent of the west section.

RESOURCE VALUE

- These areas represent a commitment by the regulatory agencies to protect and perpetuate the fish and wildlife resources contained within them for the purposes of:

  - habitat improvement
  - scientific research
  - provision of secondary benefits such as recreation and education
  - habitat management

POSSIBLE EFFECTS

- Right of way clearing and construction activities may result in the removal of vegetation cover. As a result, there may be a reduction of habitat. This may encourage the influx of more opportunistic wildlife at the expense of the original inhabitants, or reduce the carrying capacity of the habitat. This, in turn may negate further management of the area.

- There may be an alteration of ecological diversity.

- Construction activities during critical periods in the species annual cycle may adversely affect such activities as breeding, nesting, staging, and spawning.

POSSIBLE MITIGATION

- Time construction and maintenance to avoid critical periods in the species annual cycle.

- Maintain streambank vegetation as a buffer to trap sediments and reduce the rate of overland flow.

- Revegetate cleared areas immediately after construction with species that are compatible with the wildlife management/protection requirements of the regulatory agency and transmission line security.

- Use tower extensions to maximize retention of vegetation used for habitat.

B3.3.4 BIOLOGICAL RESOURCES 4

OBJECTIVE

Avoid deer winter concentration areas.

DESCRIPTION

Winter concentration areas encompass the habitat used by deer during the winter months.

This situation occupies three percent of the west section.

RESOURCE VALUE

- Deer yards are diminishing because of competing land use pressures (agriculture, forestry, urbanization, etc.). The remaining areas are becoming increasingly critical to the survival of deer populations.

- These areas provide food and shelter during the critical winter period.

- These habitat areas provide opportunities for recreational experiences, such as viewing and interpretation, and for educational and scientific studies.

POSSIBLE EFFECTS

- Right of way clearing and construction activities may result in the removal of vegetative cover. As a result, there may be a reduction of habitat. This may reduce the carrying capacity for the deer population.

- Construction during critical periods in the species annual cycle may adversely affect the deer population by forcing them into less favourable positions of the yard, or by removing prime browse or cover.

- Right of way clearing and access road construction may facilitate increased human pressure upon the deer population by opening up the yard.

POSSIBLE MITIGATION

- Time construction and maintenance activities to avoid the winter period.

B3.3.5 BIOLOGICAL RESOURCES 5

OBJECTIVE

Avoid cold and warm water fisheries.

DESCRIPTION

Warm and cold water fisheries include those lakes, creeks, rivers and marshes where known populations of sport fish occur.

The fisheries occupy eight percent of the west section.

RESOURCE VALUE

- Cold water fisheries are diminishing as a result of deteriorating water quality to the extent that their preservation is becoming increasingly important.

- Cold water fisheries provide highly sought after recreational resources.

- Warm water fisheries, although more tolerant of water quality alterations, still require protection.

- Warm water fisheries generally provide the major portion of the sport fisheries in terms of money and user days.

- Sport fishing represents a major recreational activity and economic benefit to the area.

- The sport or recreational demand for the fishery supports a bait fishery.

POSSIBLE EFFECTS

- Right of way clearing and construction activities may adversely affect fish populations. Removal of streambank vegetation may increase light penetration and water temperature, which may have varying effects on the aquatic organisms. It may alter the habitat by promoting a greater quantity and diversity of aquatic plants and fish as well as raising temperatures to intolerable limits for the indigenous fish species. Changes in productivity, water temperature nutrient loading, etc., may favour the influx of a coarse fish community. Increased sediment yields during construction may cause turbidity for short periods of time, possibly reducing water quality and affecting aquatic life.

POSSIBLE MITIGATION

- Time construction and maintenance activities to avoid the species annual spawning and incubation period.

- Maintain streambank vegetation as a natural buffer to trap sediments and reduce the rate of overland flow and maintain water temperature.

- Where a vegetation buffer is insufficient to minimize sedimentation, utilize structural devices to divert and store sediments.

- Cross waterbodies at right angles.

- Set tower foundations well back from stream channels.

Line Numbers

B3.3.6 BIOLOGICAL RESOURCES 6

OBJECTIVE

Avoid waterfowl habitat.

DEFINITION

Waterfowl habitat includes the areas known to be used for breeding, nesting, and/or staging.

This situation occupies four percent of the west section.

RESOURCE VALUE

- Waterfowl habitat is diminishing because of competing land use pressures (agriculture, forestry, urbanization). The remaining waterfowl breeding and staging areas are essential to the maintenance, production, and survival of the species. Further loss or degradation of productive waterfowl habitat would be considered critical in light of the limited habitat available.

- Waterfowl habitat provides opportunities for recreational experiences, such as viewing and interpretation, and for educational and scientific studies.

- Waterfowl hunting provides a benefit to the local and regional economy.

POSSIBLE EFFECTS

- Construction activities may place stress on the waterfowl during critical periods on their annual cycle (i.e. nesting, staging) which may reduce their reproductive success.

- Right of way clearing and construction activities may result in the removal of vegetative cover.

POSSIBLE MITIGATION

- Time construction and maintenance activities to coincide with inactive periods within waterfowl habitat areas (i.e. winter months).

- Restrict vehicular movement, access, and ROW clearing, to minimize disturbance of the habitat.

- Promote the use of indigenous vegetation in order to facilitate site restoration.

B3.3.7 BIOLOGICAL RESOURCES 7

OBJECTIVE

Avoid wetlands with no identified biological information.

DESCRIPTIONS

Wetlands represent areas that are seasonally or permanently covered by standing water to a depth not greater than two metres.

Wetlands with no biological information either have little or no representative species or habitat or have not been investigated by MNR or naturalist organizations.

Wetlands in this situation are exclusive of those contained in Biological Resources 2. They are generally smaller, and may or may not be forested.

This situation occupies six percent of the west section.

RESOURCE VALUE

- Wetlands contribute to the maintenance of water quantity and quality conditions due to their function as natural water storage reservoirs, filters and regulators of stream flow.

- Wetlands have a high educational value.

- Wetlands provide a high degree of ecological diversity.

- Wetlands are diminishing rapidly as a result of competition with other land uses, thereby making those still remaining more significant.

POSSIBLE EFFECTS

- Right of way clearing and construction activities may necessitate the removal of vegetative cover.

- There may be an alteration of ecological diversity. This may encourage the influx of more aggressive and competitive species.

- Right of way clearing and construction activities may slightly alter the hydrologic conditions of the wetlands.

POSSIBLE MITIGATION

- Construction effects may be minimized by timing construction for frozen soil conditions.

- Store fuels, lubricants, etc., to service equipment off-site.

B3.4 FOREST RESOURCES

B3.4.1 FOREST RESOURCES 1

OBJECTIVE

Avoid experimental forest areas and maple sugar bush operations.

DESCRIPTION

These areas represent high quality stands designated for hybrid poplar research and larch experiments, and sugar maple woodlots for maple syrup production.

This situation occupies less than 1 percent of the west section.

RESOURCE VALUE

- Experimental forest areas may provide scientific and/or genetic knowledge for the improvement of future timber production.

- Sugar bushes provide cash income for local farms. Average revenue is estimated at $1,200/ha/year (total value of farms was over $2 million dollars in 1980) (Agricultural Statistics for Ontario, 1981).

- Sugar bushes take a long time (50-100 years) to become established and productive.

POSSIBLE EFFECTS

- Trees will be removed to provide space for the ROW and access roads.

- Transmission facilities may interfere with the forest management activities (i.e., spraying and harvesting).

- Transmission facilities may interfere with forest research and maple sugar production. The loss of experimental areas for research may terminate specific studies before results and conclusions are obtained. This may result in a waste of monetary investment and a retardation of forest research.

POSSIBLE MITIGATION

- Time construction activities to save the sap harvest or experimental research.

- Use the right of way for access.

Line Numbers

B3.4.2 FOREST RESOURCES 2

OBJECTIVE

Avoid intensive management forest areas.

DESCRIPTION

These areas include agreement forests (the Woodlands Improvement Act and the Forestry Act), non-agreement plantations, and other intensive management forest areas.

This situation represents approximately nine percent of the west section.

RESOURCE VALUE

- Agreement forests and non-agreement plantations provide the land base necessary to produce wood fibre to maintain the local forest industry.

- Agreement forests represent government efforts to improve forest yield and woodlot quality, control erosion, and manage wildlife.

- Intensive management forest areas have potential for future wood supply (i.e. from thinning operations).

- Intensive management forest areas represent high combined investments of time, manpower, and money to increase productivity.

POSSIBLE EFFECTS

- Trees will be removed to provide space for the right of way and access roads.

- Transmission facilities may interfere with the management of the forest, and/or the operation of mechanical devices (i.e. site preparation, spraying, harvesting, etc.) and the raw material supply.

- Cutting would contravene formal contracts (WIA and Agreement Forest) between government and individuals or public agencies.

POSSIBLE MITIGATION

- Harvested wood can be utilized, whenever possible, to reduce immediate raw material losses.

- Use the ROW for access.

Line
Numbers

B3.4.3 FOREST RESOURCES 3

OBJECTIVE

Avoid productive forest lands with valuable species of mature or all-aged stands.

DESCRIPTION

These forest lands consist of species such as oak, sugar maple, basswood, white ash, yellow birch, walnut, pines, spruces and fir that are currently used for commercial timber production.

This situation represents less than eight percent of the west section.

RESOURCE VALUE

- Productive forest lands with valuable mature species provide the major supply of raw materials to support various forest industries in the area.

- Forest industries provide a major economic contribution to the area through employment (i.e. Domtar at Cornwall).

- Productive forest lands used for timber production are limited in area due to infringement by other competing land uses.

POSSIBLE EFFECTS

- The rights of way and access roads will be clear cut and will take forest lands out of timber production.

- Transmission facilities may interfere with forest management activities such as harvesting and spraying.

- Right of way clearing may alter the raw material supply; depending upon market conditions.

POSSIBLE MITIGATION

- Same as Forest Resources 2.

B3.4.4 FOREST RESOURCES 4

OBJECTIVE

Avoid productive forest lands with valuable species of immature or young stands.

DESCRIPTION

These forest lands consist of immature or young stands with valuable species (such as oak, sugar maple, basswood, white ash, yellow birch, walnut, pines, spruces and fir), and are currently used for commercial timber production.

This situation represents approximately eight percent of the west section.

RESOURCES VALUE

- Productive forest lands with valuable immature species provide a supply of raw materials to support various forest industries in the area.

- Forest industries provide major economic contributions to the area through employment and production (i.e. Domtar at Cornwall).

- Productive forest lands used for timber production are limited in area due to infringement by other competing land uses.

- Immature trees provide for the future supply of large size timber.

POSSIBLE EFFECTS

- Same type of possible effects as Forest Resources 3.

- Right of way clearing may alter the mid to long term raw material supply; dependent upon market conditions.

POSSIBLE MITIGATION

- Same as Forest Resources 2.

B3.4.5 FOREST RESOURCES 5

OBJECTIVE

Avoid productive forest lands with intermediate value, and low value species of all ages.

DESCRIPTION

These areas consist of mature, immature, young, and all-aged stands of intermediate value species (such as poplar, white birch, elm, soft maple, tamarack, hemlock, and cedar, and low value species such as alder, ironwood, etc.), and are currently used for commercial timber production.

This situation represents about nine percent of the west section.

RESOURCE VALUE

- Productive forest lands with all-age intermediate and low value species provide a supply of raw material to support various forest industries in the area, including pulp and paper plants.

- Productive forest lands used for timber production are limited in area due to infringement by other competing land uses.

- Mature trees and all-aged classes provide large size timbers and, therefore, have immediate market value.

- Immature and young trees provide for the future supply of large size timber.

POSSIBLE EFFECTS

- Same type of possible effects as Forest Resources 3, but the right of way could be selectively cut.

- Right of way clearing may alter the short or long term supply of intermediate value species; depending upon market conditions.

POSSIBLE MITIGATION

- Same as Forest Resources 2.

B3.5 HERITAGE RESOURCES

B3.5.1 HERITAGE RESOURCES 1

OBJECTIVE

Avoid confirmed archaeological sites and known historical routes and sites.

DESCRIPTION

These sites have been confirmed by the Ministry of Citizenship and Culture, the Ministry of Natural Resources, or Parks Canada, as being archaeologically and/or historically significant. They include various archaeological finds, the Rideau Canal and lock stations, historical settlement roads, early railways, etc.

There are only a limited number of sites, and they occupy approximately five percent of the west section.

RESOURCE VALUE

- These sites provide opportunities for gaining educational, historical and scientific awareness of our cultural heritage.

- Identified sites may be of national, provincial or local significance.

- Some identified sites may, as yet, still require a detailed investigation by professional archaeologists and historians to reveal the full heritage/historical record.

- These identified areas represent an investment on the part of Ministry Citizenship and Culture and others.

- These sites are recognized under the Ontario Heritage Act (1974).

POSSIBLE EFFECTS

- Transmission lines located on confirmed archaeological sites may conflict with provincial heritage legislation.

- The appearance of the surrounding landscape may be an integral part of a historical or archaeological site. Hydro transmission facilities may permanently alter this character, and may be considered incompatible.

- It may be necessary to remove and/or relocate historic buildings from the transmission right of way. This may result in the loss of historical knowledge and/or educational opportunities.

- The right of way and access roads may create new and uncontrolled access to newly discovered or existing archaeological sites.

POSSIBLE MITIGATION

- Minimize disturbance to sites by consulting with Ministry of Citizenship and Culture prior to construction.

- Control access to ROW or roads by limiting the number of new access roads and number of roads maintained after construction.

- Minimize visibility of the transmission facilities by applying selective cutting practices and strategically locating new access roads.

B3.5.2 HERITAGE RESOURCES 2

OBJECTIVE

Avoid reported but unsubstantiated archaeological sites, and areas having archaeological potential.

Line
Numbers

DESCRIPTION

The reported but unsubstantiated archaeological sites have been identified through the Ministry of Citizenship and Culture as a result of the discovery of artifacts. Areas having archaeological potential were identified by correlating existing landform characteristics with established cultural attributes of the early native peoples. These areas are generally associated with lake and river systems, post-glacial shorelines, and landforms commanding a view of valleys, lakes, etc.

This situation occupies approximately nine percent of the west section.

RESOURCE VALUE

- These areas may provide valuable archaeological information.

- These areas may be of national, provincial or local significance.

POSSIBLE EFFECTS

- The character of the surrounding landscape may be an integral part of an archaeological site. Hydro transmission facilities may permanently alter this character, and may be considered incompatible.

- Construction activities may accidently alter or disturb archaeological sites. This may result in the loss of scientific knowledge and/or educational opportunities.

- The right of way and access roads may create new and uncontrolled access to potential or newly discovered archaeological sites.

POSSIBLE MITIGATION

- The Ministry of Citizenship and Culture, under the Ontario Heritage Act (1974), can stop construction on a site upon discovery of archaeological artifacts.

- An archaeological survey may be undertaken by a professional archaeologist to establish the significance of reported but unsubstantiated archaeological sites, and the actual existence of the identified potential sites, in order to establish the mitigation required.

- Upon verification of an archaeological site, mitigation measures may be implemented to:

    - minimize disturbance to sites by consulting with Ministry of Citizenship and Culture prior to construction, etc.

    - control access to ROW or roads by limiting the number of new access roads and number of roads maintained after construction, etc.

B3.5.3 HERITAGE RESOURCES 3

OBJECTIVE

Avoid representative cultural landscapes that exemplify settlement patterns or land use practices.

DESCRIPTION

Cultural landscapes represent typical areas that evoke a general impression of current or former land use practices found within the study area. Areas of significance (such as typical active and abandoned agricultural lands, natural areas, and concentrations of abandoned mines, etc.) have been identified to exemplify typical cultural landscapes of eastern Ontario. Some of the buildings or sites within these landscapes may no longer exist in their original state, but may still evoke local historical influence.

This situation occupies approximately ten percent of the west section.

RESOURCE VALUE

- These landscapes provide a visual record of the history of local communities, and the region. They also represent a cultural tie to earlier periods.

- These landscapes may be sensitive to visual changes, depending upon the type of representative features contained within the landscape.

POSSIBLE EFFECTS

- The presence of transmission facilities may alter the physical appearance of the cultural landscape.

- Right of way clearing may alter the perception of the cultural landscape through the removal of hedgerows and woodlots that define field patterns, or the removal of structures or forest vegetation.

POSSIBLE MITIGATION

- Minimize disturbance to structures of potential historic significance by consulting with Ministry of Citizenship and Culture prior to construction.

B3.6 HUMAN SETTLEMENT

B3.6.1 HUMAN SETTLEMENT 1

OBJECTIVE

Avoid existing urban settlements.

Line
Numbers

DESCRIPTION

This situation includes cities, towns and villages which have a defined urban form (i.e. primary, secondary and/or tertiary industry; community services such as sewers, watermains, etc.).

These settlements occupy one percent of the west section.

RESOURCE VALUE

- The existing built up areas represent economic and social investments on the part of the owners and/or the communities.

- There may be historical/emotional attachments to the areas as a result of the age of the development.

- They may provide a setting for a wide range of community activities for the residents as well as for the people in the surrounding areas.

- There may be a scarcity of suitable replacement lands with associated services such as sewer and water.

POSSIBLE EFFECTS

- Transmission facilities may conflict with officially stated and/or approved land use policies.

- Existing structures or facilities may be permanently removed.

- There may be long term effects on existing or future land use patterns and developments. Transmission facilities may create a barrier to expansion or hinder the development of the land.

- The presence of transmission facilities may indirectly alter the visual character of neighbourhoods.

- During the construction phase, noise, dust, and other inconveniences may result for short periods of time.

POSSIBLE MITIGATION

- It may be possible to minimize interference with existing land use patterns by following linear severances such as railways, roads, existing utility rights of way, and other linked open space systems within urban areas.

- It may be possible to minimize visual intrusion by planting compatible vegetative screens and applying selective cutting practices.

B3.6.2 HUMAN SETTLEMENT 2

OBJECTIVE

Avoid existing rural strip developments and cottage developments.

DESCRIPTION

The concentrations include numerous small crossroad developments, and strip developments with no defined community structure. It may include commercial or other facilities too small to be designated by the institutional-commercial-industrial objective.

Cottage developments are found on the fringe of many lakes on the Shield.

This situation occupies about seven percent of the west section.

RESOURCE VALUE

- The existing built-up areas represent economic and social investments on the part of the owners and/or the communities.

- There are historical/emotional attachments to the areas as a result of the age of the developments.

- They may provide a setting for a wide range of activities for the residents, as well as the for people in the surrounding area.

POSSIBLE EFFECTS

- Same as Human Settlement 1.

POSSIBLE MITIGATION

- Same as Human Settlement 1.

B3.6.3 HUMAN SETTLEMENT 3

OBJECTIVE

Avoid existing institutional, commercial and industrial facilities.

Line
Numbers

DESCRIPTION

This situation includes all government facilities, such as Department of National Defence bases, communication tower fields, research facilities, correctional centres, industrial developments, dumps and sewage lagoons, and existing licensed and/or approved airports and airfields.

All airports are considered which have ground facilities (i.e. hangars, fuel storage, parking). Airstrips without ground facilities are not included at this stage of study.

These sites are generally small and localized. However, there are numerous facilities in the immediate vicinity of Ottawa.

This situation represents less than one percent of the west section.

RESOURCE VALUE

- The existing facilities represent economic and social investments on the part of the owners and/or the communities.

- In many instances, these facilities provide employment and other benefits to the local and/or regional areas.

- In some cases, it may be the only facility providing specific services to the public and, thus, would be more valuable because of its scarcity.

- Some of these facilities are location-oriented and/or depend on local infrastructure and, thus, would be sensitive to relocation.

POSSIBLE EFFECTS

- Existing structures or facilities may be removed. Activities associated with the present use (such as interference with airplane traffic approaching air fields) may be disrupted.

- There may be effects on existing or future land use patterns and developments. Transmission facilities may create a barrier to expansion or hinder the development of the land.

- Signals to and from certain communication towers may be adversely affected by the presence of transmission facilities.

- Transmission facilities may conflict with officially stated and/or approved land use policies. The Federal Department of Transport has licensing requirements that limit the height of structures within the vicinity of licensed airports in order to ensure flight safety.

POSSIBLE MITIGATION

- Same as Human Settlement 1.

B3.6.4 HUMAN SETTLEMENT 4

OBJECTIVE

Avoid areas of approved residential and cottage development.

DESCRIPTION

This situation includes areas which have been approved by the Ministry of Housing for development. They may or may not have any services (eg. sewers, water, streets) already developed, and they may or may not be registered or surveyed. These areas may be estate residential (usually to 5 hectares in size), or normal building lots (approximately 750 square metres).

This situation occurs throughout the study area, and occupies approximately one percent of the west section.

RESOURCE VALUE

- The land has a higher economic value since it is severed and has met all approvals for development. If services are present, it has an even higher economic value since the developer spent additional monies on the lots.

POSSIBLE EFFECTS

- Transmission facilities may create a barrier to expansion or hinder planned development, and may reduce the number of available lots as designated. The presence of lines may also increase servicing costs (i.e. increased sewer and water costs per lot).

- Transmission facilities may conflict with the visual character of the planned development.

- There is a potential for these areas to be developed prior to the construction of the line as a result of the long approval and acquisition process. Adjacent property owners may not be aware of, or prepared for, the construction of the line.

POSSIBLE MITIGATION

- Same as Human Settlement 1.

B3.7 MINERAL RESOURCES

B3.7.1 MINERAL RESOURCES 1

OBJECTIVE

Avoid active quarries.

Line Numbers

DESCRIPTION

This situation includes licensed and unlicensed quarries. They may be on Crown or private land, and include both the active area of the operation and the licensed reserves which will be exploited during the lifespan of the operations.

This situation represents less than one percent of the west section.

RESOURCE VALUE

- The quarries represent an economic investment on the part of the owners.

- Viable bedrock aggregate deposits are limited, non-renewable, natural resources.

- Quarries represent the highest volume and value of mineral resource production in the study area.

- The aggregate industry is a significant contributor to the local economy.

POSSIBLE EFFECTS

- Transmission facilities may conflict with officially stated and/or approved designated areas for extractive or planned operations.

- Transmission facilities restrict exploitation of a limited, non-renewable, natural resource. The location of transmission facilities on or adjacent to quarry sites may preclude normal extractive procedures, such as blasting operations, thus, decreasing the viability of the quarry. There may be long term interference with ongoing operations through a general loss of efficiency. Indirect effects that may result are an increase in marketing costs due to interference with vehicular traffic and machinery. This may result in a loss of economic potential and may increase marketing costs if it becomes necessary to develop reserves further from the demand centres.

POSSIBLE MITIGATION

- Where possible, remove the resource prior to tower construction in quarries.

- Maximize clearance of conductors to minimize interference with mining equipment.

- Increase tower span to avoid locating towers in active quarries.

B3.7.2 MINERAL RESOURCES 2

OBJECTIVE

Avoid active pits.

DESCRIPTION

This situation includes licensed and unlicensed pits. They may be on Crown or private land, and include both the active area of the operations and the licensed reserves which will be exploited during the lifespan of the operations.

This situation does not include wayside pits or borrow pits.

This situation represents less than three percent of the west section.

RESOURCE VALUE

- Sand and gravel pits represent an economic investment on the part of the owner.
- Sand and gravel deposits are limited, non-renewable, natural resources.
- Pits represent the most widespread mining activity in the study area.
- The aggregate industry is a significant contributor to the local economy.

POSSIBLE EFFECTS

- Transmission facilities may conflict with officially stated and/or approved designated areas for extractive or planned operations.
- Transmission facilities restrict exploitation of a limited, non-renewable, natural resource. There may be long term interference with ongoing operations through a general loss of efficiency and by limiting extraction below tower bases. Indirect effects that may result are an increase in marketing costs due to interference with vehicular traffic and machinery. This may result in a loss of economic potential, and may increase marketing costs if it becomes necessary to develop reserves further from the demand centres.

POSSIBLE MITIGATION

- Where possible, remove the resource prior to tower construction in pits.
- Maximize clearance of conductors to minimize interference with mining equipment.
- Increase tower span to avoid locating towers in active pits.

B3.7.3 MINERAL RESOURCES 3

OBJECTIVE

Avoid geologic sites and features which have recognized scientific or educational value.

DESCRIPTION

Some geologic sites and features (such as glacial spillways, marine beaches, glacial structures, varved clay deposits, fossils, unique bedrock formations, moderately sensitive clay formations, etc.) have been identified by MNR as having some measure of uniqueness deemed worthy of recognition and preservation.

The resources are, for the most part, small scale, relatively scarce, and scattered randomly throughout the study area.

This situation occupies less than one percent of the west section.

RESOURCE VALUE

- The resources have been recognized as possessing varying degrees of scientific or educational value.

- Some features are site specific and can be compatible with a transmission right of way, but are sensitive to disturbance should they be affected by a transmission tower.

POSSIBLE EFFECTS

- Transmission facilities may conflict with designated earth science or environmental protection areas.

- Direct effects on geologic sites may range from low to high, depending upon the size of feature and the proposed tower location. Transmission facilities may result in the destruction of geologic sites and features or may protect the features from competing land uses.

POSSIBLE MITIGATION

- Survey the ROW prior to construction to identify precise locations of these sites and features and avoid or protect these sites during construction.

- Some features encountered could be preserved from competing land uses by the right of way.

B3.7.4 MINERAL RESOURCES 4

OBJECTIVE

Avoid areas of high sand and gravel reserve and industrial mineral potential.

DESCRIPTION

This situation includes reserves of high potential sand and gravel and industrial minerals (marble and mica) which have been identified by the Ministry of Natural Resources for inclusion in this study.

This situation occupies about five percent of the west section.

RESOURCE VALUE

- Aggregate reserves are limited, non-renewable natural resources.

- Future demand for aggregate will remain high for a variety of construction uses.

- Aggregate can only be economically transported over relatively short distances and, thus, reserves in areas such as the Shield, where industrial minerals are not common, become more valuable.

POSSIBLE EFFECTS

- Transmission facilities may interfere with planned locations and future uses of aggregate reserve and industrial mineral extraction operations.

- There may be long term restrictions on the availability of mineral deposits in proximity to markets. This may lead to higher transportation costs to utilize unaffected mineral reserves since the relative scarcity will make them more valuable.

POSSIBLE MITIGATION

- Minimize the portion of the reserve deposit obstructed by tower bases.

B3.8 RECREATION RESOURCES

B3.8.1 RECREATION RESOURCES 1

OBJECTIVE

Avoid federal, provincial, and conservation area parks.

DESCRIPTION

This situation includes federal parkland along the Rideau Canal, Frontenac (Natural Environment), Murphy's Point (Natural Environment), and Silver Lake (Recreation) Provincial Parks, as well as regional and conservation authority recreation parks.

This situation occupies three percent of the west section.

Line
Numbers

RESOURCE VALUE

- These parks provide recreational opportunities and experiences, and protect provincially significant natural, cultural and recreational features that are close to the large population centres of eastern Ontario.

- These parks are protected by federal, provincial or regional park policies and legislation (i.e. National Parks Act (1930), ARC Agreement (1975), Provincial Parks Act).

- Frontenac Park is unique in southern Ontario as a natural environment park with a "wilderness" theme.

- These parks are intensively utilized and contribute to the regional and local economies.

POSSIBLE EFFECTS

- New transmission lines through these parks will conflict with park policies and legislation. Tower lines are incompatible with the wilderness and natural environment park concepts. Recreational experiences may be altered through changes in the appearance of the landscape resulting from the removal of vegetation, and the presence of the towers.

- There may be a loss of facilities (i.e. campsites, buildings, etc.) which could adversely affect tourism in the area.

- There may be a loss of resources upon which certain recreational activities depend, particularly interpretive programs.

- Transmission lines may interfere with, or inhibit recreational activities by forming artifical barriers. As a result, there may be a loss of future development potential.

POSSIBLE MITIGATION

- Allow the regeneration of compatible plant species on the right of way.

- Depending on site conditions, many of the losses of facilities can be reversed by providing replacement facilities.

B3.8.2 RECREATION RESOURCES 2

OBJECTIVE

Avoid the viewshed of the Rideau Canal System and Westport Mountain.

DESCRIPTION

This situation includes all land in the line of sight of persons using the Rideau Canal and associated lakes. It also includes the viewshed of Westport Mountain, which has a greater zone of influence than that defined by the sight lines from the Rideau itself.

The viewshed of the Rideau Canal runs in a northeast to southwest direction. The viewshed of Westport Mountain runs east/west across the centre of the study area for a distance of about 25 km.

This situation occupies nine percent of the west section.

RESOURCE VALUE

- The Rideau Canal is an unique historical feature within eastern Ontario which is nationally recognized. Parks Canada has established policies to protect the historic waterway.

- The Rideau Canal is also very intensively used for canoeing, cottaging, the associated Rideau Trail, and numerous other heritage resources.

- Westport Mountain is a regionally significant landmark. It is unique within the study area and the entire region.

POSSIBLE EFFECTS

- Tower lines in proximity to the Rideau Canal would conflict with Parks Canada policy. Tower lines are considered to be incompatible with the historic theme of the waterway.

- Viewers may possess preconceived ideas about the visual character of the Rideau Canal and Westport Mountain. These preconceptions generally do not include transmission tower lines. The visual component of the recreational experience may be altered though changes in the appearance of the landscape; such as skylining, removal of vegetation, or contrasts with the existing landscape character. The intensity of each of these effects will vary according to site conditions, but the effects would persist throughout the life of the line.

- Cresting and skylining generally occur at the periphery of the viewshed, as it is often crests that form the physical boundary for viewsheds. The remainder of the changes, while occurring on-site, are generally visible from off-site, and so their zone of influence is greater than just the right of way itself.

POSSIBLE MITIGATION

- Allow regeneration of compatible plant species on the right of way.

- The length of line visible from the waterway can be minimized by locating towers within "blind spots", if they exist, or by crossing the Rideau Canal and Westport Mountain where the viewshed is narrowest.

Line
Numbers

B3.8.3 RECREATION RESOURCES 3

OBJECTIVE

Avoid existing private, commercial and public recreation facilities.

DESCRIPTION

This situation includes resorts, ski clubs, private parks, campgrounds, golf courses, scout camps and municipal parks. These resources are generally activity or user oriented.

These sites are generally small and, in total, represent less than one percent of the west section.

RESOURCE VALUE

- The recreation industry constitutes a significant proportion of the economy of eastern Ontario.

- The existing private, commercial, and public recreation facilities represent economic investments on the part of the owners.

POSSIBLE EFFECTS

- There may be a loss of facilities (i.e. campsites, buildings, etc.) which could adversely affect the tourist operation.

- There may be a loss of the natural resources upon which the operation depends, particularly interpretive programs.

- Recreational experience may be altered through changes in the appearance of the landscape resulting from such effects as the removal of vegetation, cresting and the presence of towers.

- Transmission lines may interfere with, or inhibit, activities by forming artificial barriers. As a result, there may be loss of development potential.

POSSIBLE MITIGATION

- Selective clearing and planting of compatible vegetative screens could reduce the visibility of the towers from selected viewpoints.

B3.8.4 RECREATION RESOURCES 4

OBJECTIVE

Avoid the viewsheds of cottage lakes.

DESCRIPTION

The viewsheds were mapped for all lakes that had concentrations of cottages (as identified by the Human Settlement Factor). This situation does not include the Rideau Canal and associated lakes (see Recreation Resources 1).

This situation occupies approximately seventeen percent of the west section.

RESOURCE VALUE

- Cottaging is the major privately owned recreational activity in the study area.

- Cottaging provides an economic benefit to surrounding communities through taxes and commercial sales.

- Cottage lakes are sensitive to changes to the appearance of the landscape since most cottages are chosen for their "natural" setting.

POSSIBLE EFFECTS

- Recreational experiences may be altered through changes to the appearance of the landscape, such as skylining, the removal of vegetation, and scale contrasts. Cresting and skylining generally occur at the periphery of the viewshed, as it is often a crest that forms the boundary of a viewshed. The remainder of the changes, while occurring on-site, are generally visible from off-site, and so their zone of influence is greater than just the right of way itself. The visual changes would exist even if the lakes were not used for cottaging.

- Cottage owners perceive transmission towers as being out of character with the cottaging experience.

POSSIBLE MITIGATION

- Allow the regeneration of compatible plant species on the right of way.

- The length of line visible from the lake(s) can be minimized by locating towers within "blind spots", if they exist.

- Maintain a screen of compatible vegetation along shorelines.

Line Numbers

B3.8.5 RECREATION RESOURCES 5

OBJECTIVE

Avoid the viewsheds of designated linear recreational features.

DESCRIPTION

Viewsheds were mapped for all canoe routes and special interest routes as identified by external agencies.

The canoe routes follow many of the major river and lake systems, including the Mississippi, Rideau, and Tay Rivers.

Special interest roads include the TransCanada (Highways 2 and 7), the Perth Road, the Battersea Route, and the Lanark County Byways.

This situation covers about two percent of the west section.

RESOURCE VALUE

- Canoeing represents a significant outdoor/wilderness recreational activity.

- Scenic roads/highways are an important aspect of pleasure driving, as a form of recreation. The views from these routes provide a visual impression of the region.

- There are viewing expectations on the part of users. The expectations are related to scenic values, and in some cases, historic significance.

POSSIBLE EFFECTS

- Recreational experiences may be altered through changes to the appearance of the landscape by removal of vegetation, skylining, or increasing contrasts with the existing character of the landscape.

- The visibility of the line may be increased because of the openness of the river/lake system. These effects could extend over a very wide area.

- The presence of towers may result in a contrast with the linear features in terms of scale and character.

POSSIBLE MITIGATION

- Allow regeneration of compatible plant species on the right of way, and maintain a compatible vegetation screen along the shoreline if the right of way crosses a canoe route.

- The length of line visible from the waterways can be minimized by locating towers within "blind spots", if they exist, or by crossing the linear feature at right angles or where the viewshed is narrowest.

B3.8.6 RECREATION RESOURCES 6

OBJECTIVE

Avoid provincial park and conservation area reserves.

DESCRIPTION

This situation includes existing provincial park and conservation area reserves on Crown land.

These reserves are generally small in size, and represent less than one percent of the west section.

RESOURCE VALUE

- These areas provide the potential for future recreational opportunities that will become increasingly scarce as the population continues to increase.

POSSIBLE EFFECTS

- There may be a loss of resources upon which certain recreational activities depend, particularly interpretive programs. As a result, there may be a loss of future development potential.

- Transmission lines may interfere with, or inhibit, activities by forming artificial barriers.

POSSIBLE MITIGATION

- None.

B3.9 ENGINEERING/COST CONSTRAINT

B3.9.1 ENGINEERING/COST CONSTRAINT 1

OBJECTIVE

Avoid lakes and major navigable waterways which pose engineering and cost restrictions to transmission line development.

Line Numbers

DESCRIPTION

This situation includes all lakes and rivers which have defined widths greater than 500 metres. This distance is considered to be the maximum desirable span between transmission towers. Technical and economic complications are significantly greater with longer spans. These features restrict the location and construction of transmission lines.

The lakes and rivers are located primarily on the Shield.

This situation occupies approximately twelve percent of the west section.

RESOURCE VALUE

- The lakes and rivers serve as an important natural resource for tourism and other related recreational uses (such as cottaging, boating, fishing, swimming, etc.).

- The lakes and rivers provide habitat for aquatic communities (such as cold and warm water fish species, waterfowl, nesting and staging, etc.).

- The lakes and rivers serve as a source of commercial activity (such as bait and commercial fishing, wild rice harvesting, bullfrog harvesting, etc.).

- The Rideau Canal System and associated lakes is an unique historical feature within eastern Ontario that is nationally recognized. Parks Canada has established policies to protect the historic waterway.

POSSIBLE EFFECTS

- It may be necessary to construct massive tower structures in order to span large bodies of water. These structures may be visible over long distances across water bodies.

- Transmission lines may adversely affect recreational uses of lakes (such as those used for sea plane approaches and landings).

- Transmission facilities may interfere with migratory bird fly-ways.

POSSIBLE MITIGATION

- Under the provisions of the Navigable Water Protection Act, transmission towers are classified as obstructions and must be painted orange and white and may require red obstruction lights or high intensity white flashing lights.

B3.9.2 ENGINEERING/COST CONSTRAINT 2

OBJECTIVE

Avoid sensitive/unique geologic features which pose engineering and cost restrictions to transmission line development.

Line Numbers

DESCRIPTION

This situation includes extremely sensitive geologic sites and features, such as recent landslide areas, and highly unstable leda clay areas; unique geologic sites and features, such as karst formations (limestone caves), which may pose stability problems to Hydro facilities; and the steep southern face of Westport Mountain, which represents a major obstacle to span within the study area.

Sensitive landslide areas and highly unstable leda clay areas are commonly associated with the many river systems which cross the St. Lawrence and Ottawa Valley Lowlands. These areas are subject to rapid mass movements initiated either through natural processes or the activities of man. These features restrict the location and construction of transmission lines.

A limited number of unique karst features are found in areas underlain by Paleozoic limestone bedrock. The presence of subsurface solution caves could pose a severe construction problem where tower structures cannot be supported by underlying bedrock.

This situation occupies less than one percent of the west section.

RESOURCE VALUE

- All sites and features are recognized as possessing unique regional scientific or educational value. Many of these sites are recommended for protection and preservation by the MNR.

- Although some features are site specific, all features are highly sensitive to disturbance.

POSSIBLE EFFECTS

- The possibility of severe disturbance of landslide areas makes it dangerous and prohibitive to cross. Disturbance of extremely sensitive leda clays could result in landsliding on and off the right of way, resulting in a permanent change in the landscape, and damage or complete destruction of transmission facilities.

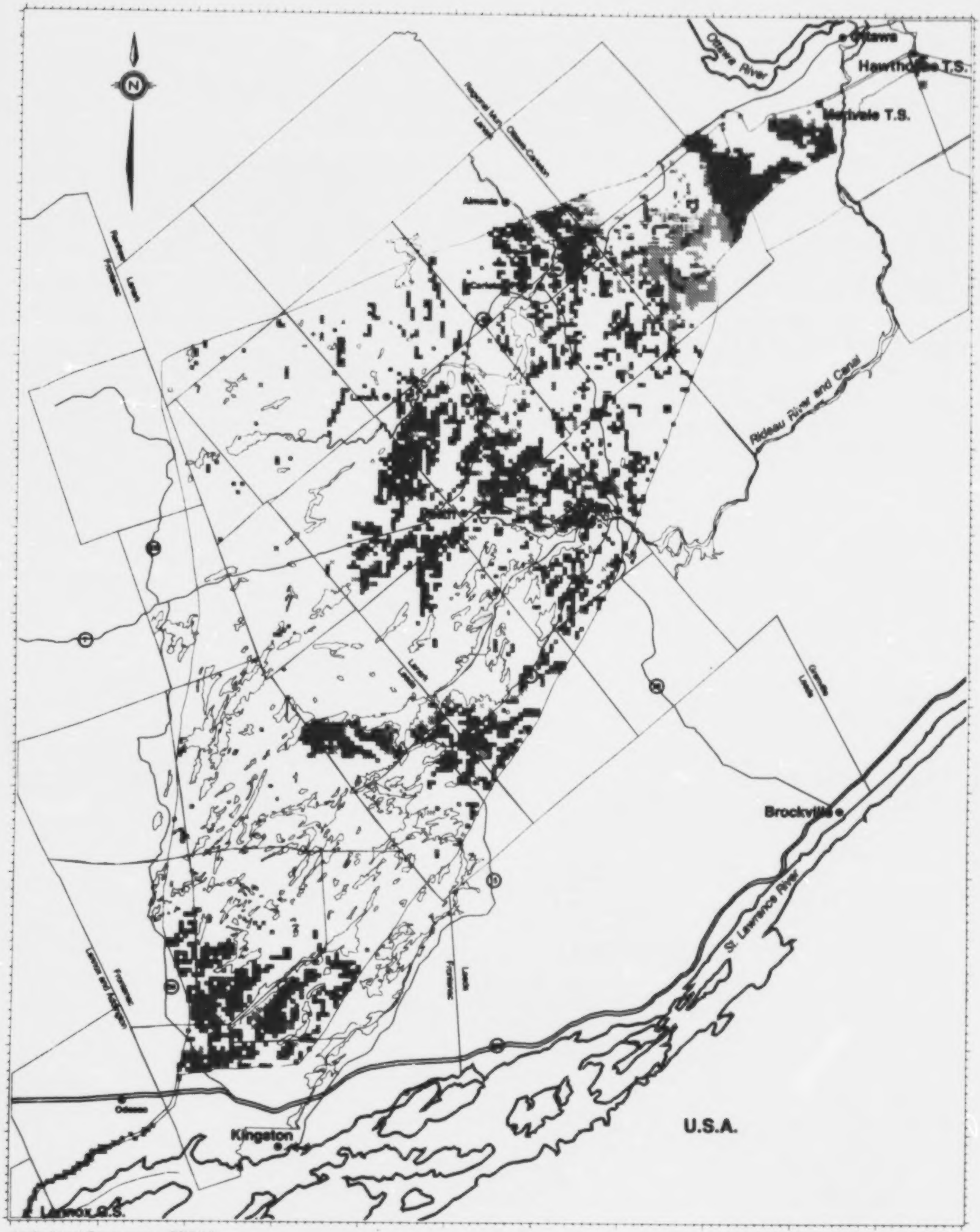
- Disturbance of the site specific karst features could result in destruction of caves where transmission facilities cannot be supported by underlying bedrock.

POSSIBLE MITIGATION

- Survey the ROW prior to construction to identify precise locations of these features and avoid or protect these sites during construction.

APPENDIX B.4

FACTOR MAPS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Brockville
St. Lawrence River
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Frontenac
Frontenac
Lennox and Addington
Odessa
Kingston
U.S.A.
Lennox G.S.

Agricultural Resources – ERWAR

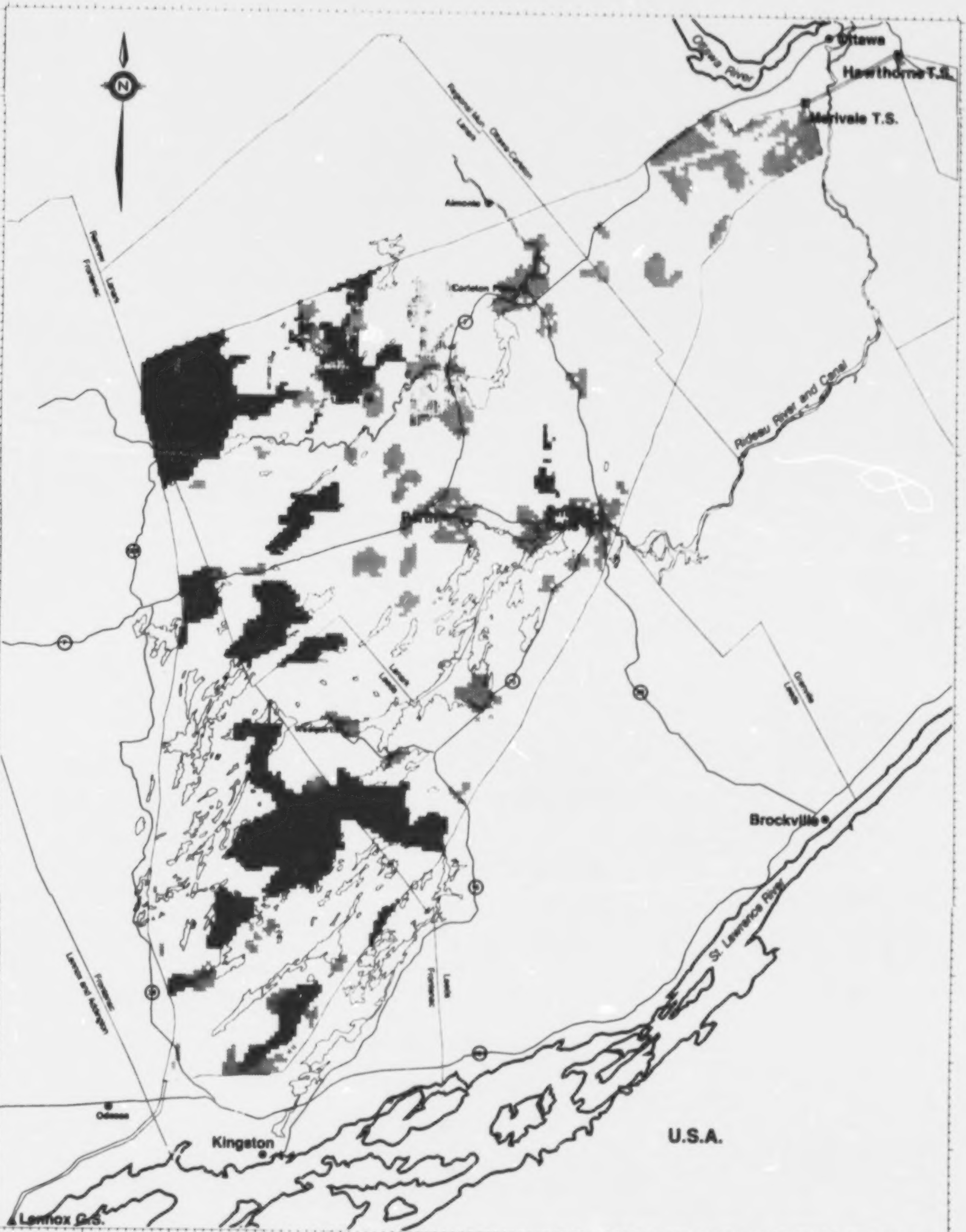
Legend

■ Specialty crop production areas and CLI soil capability class 1 in agriculture

■ CLI soil capability classes 2, 3 in agriculture

▨ CLI soil capability classes 4 in agriculture

□ CLI soil capability classes 5, 6 in agriculture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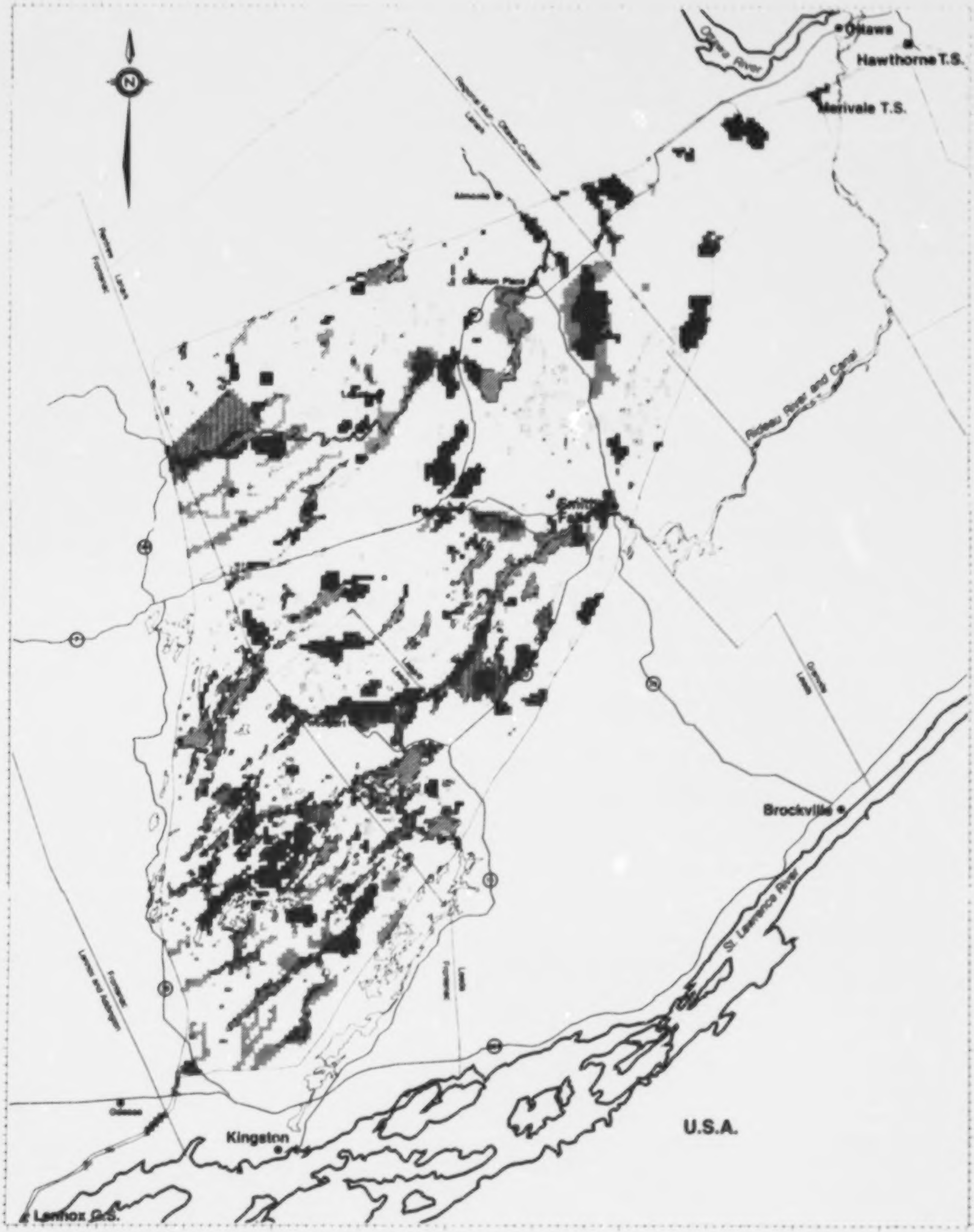
Appearance of the Landscape – ERWAL

Legend

- ■ Landscapes characterized by high hills
- ■ Viewsheds of existing settlement
- ▨ Landscapes characterized as hilly
- ▨ Ridge farm landscapes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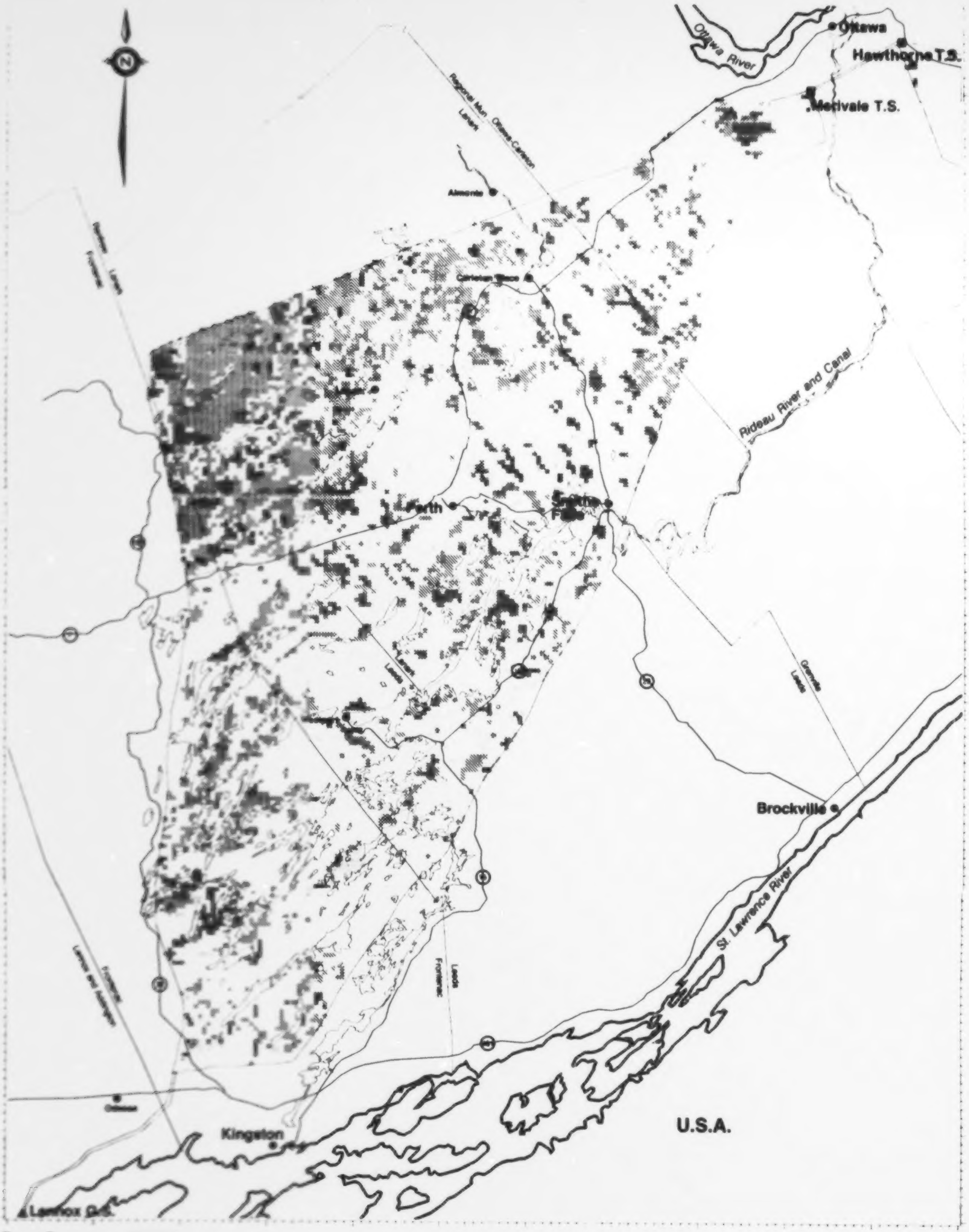
Biological Resources – ERWBR

Legend

- ■ Biological areas considered rare, unique, sensitive or significant
- ■ Biologically sensitive wetlands
- ■ Fish and wildlife protection/management areas
- ■ Deer winter concentration areas
- ▨ Waterfowl habitat
- ▨ Cold and warm water fisheries
- ░ Wetlands with no identified biological information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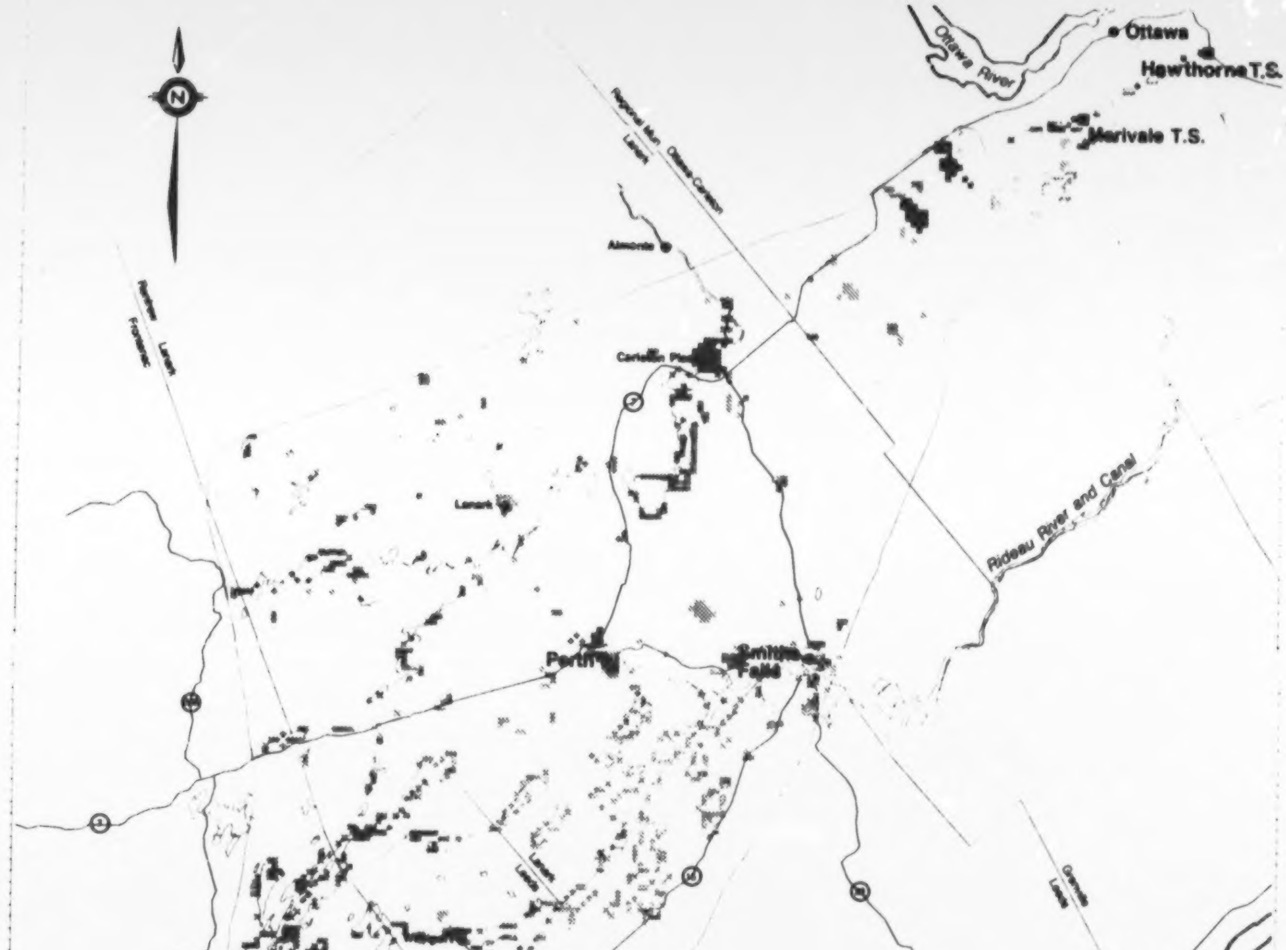
Forest Resources – ERWFR

Legend

- ■ Experimental forest areas, maple sugar bush operations
- ■ Intensive management forest areas
- ■ Productive forest lands with valuable species of mature or all aged stands
- ▨ Productive forest lands with valuable species of immature or young stands
- ░ Productive forest lands with intermediate value, and low value species of all ages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Human Settlement - ERWHS

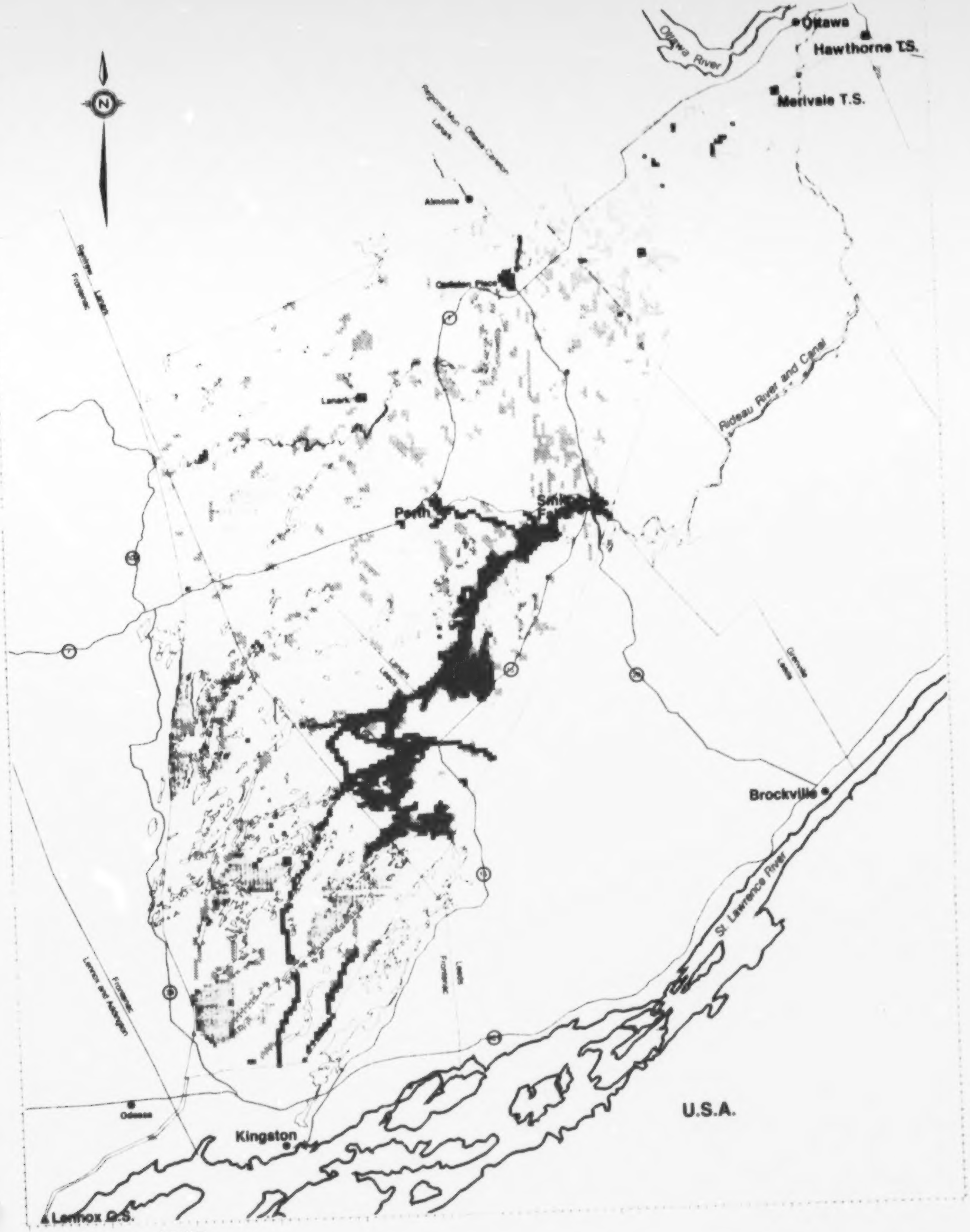
Legend

■ Existing urban settlements

■ Existing rural strip developments and cottage developments

Existing institutional, commercial and industrial facilities

Approved residential and cottage developments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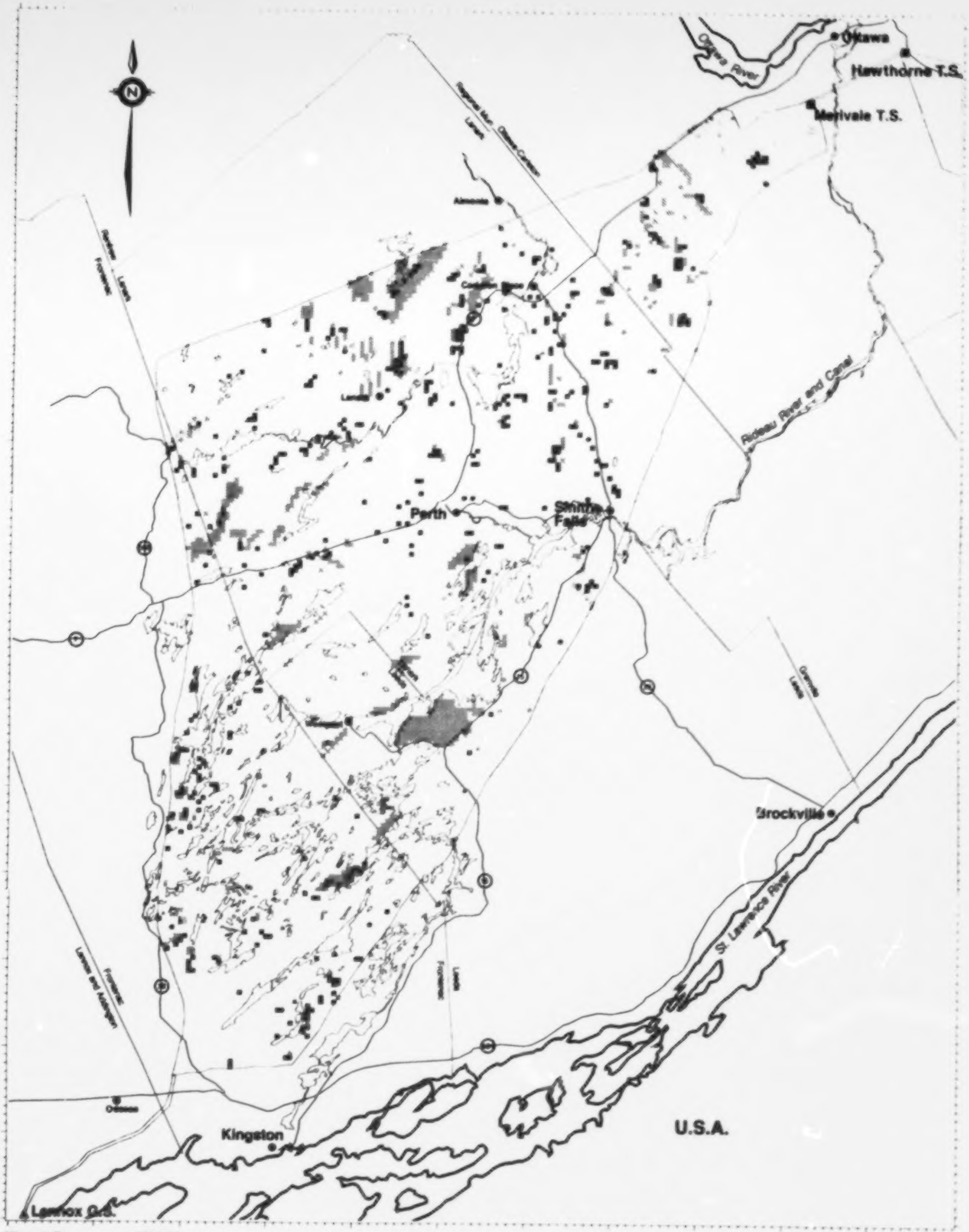
Heritage Resources – ERWHR

Legend

- ■ Confirmed archaeological sites, known historical routes and sites
- ▨ Potential archaeological sites and areas
- ░ Historically representative cultural landscapes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Rideau River and Canal
Brockville
St. Lawrence River
Kingston
Odessa
U.S.A.
Lennox G.S.

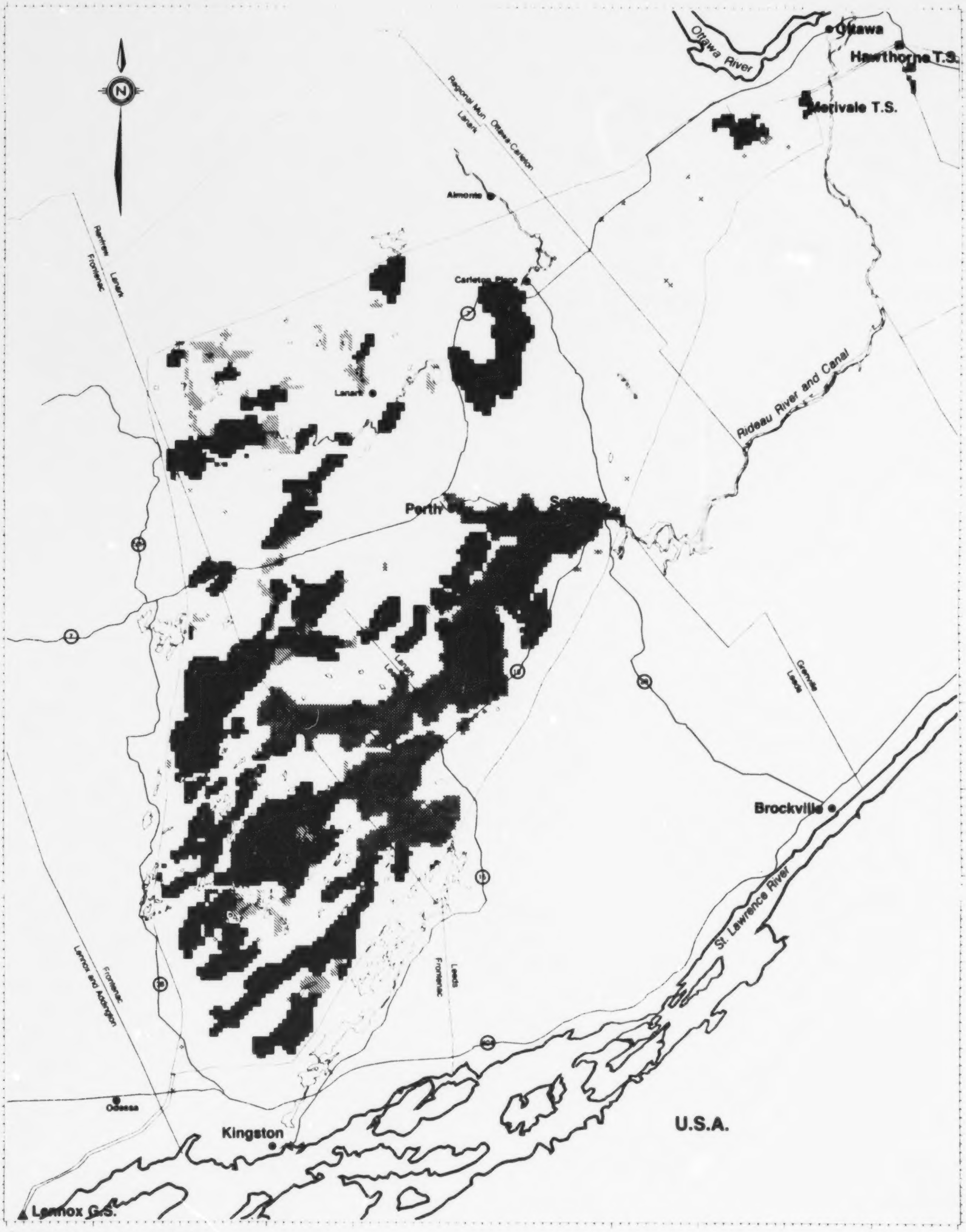
Mineral Resources – ERWMR

Legend

■ Active pits and quarries

▨ Geologic sites and features with recognized value

▒ Areas of high sand and gravel reserve and industrial mineral potential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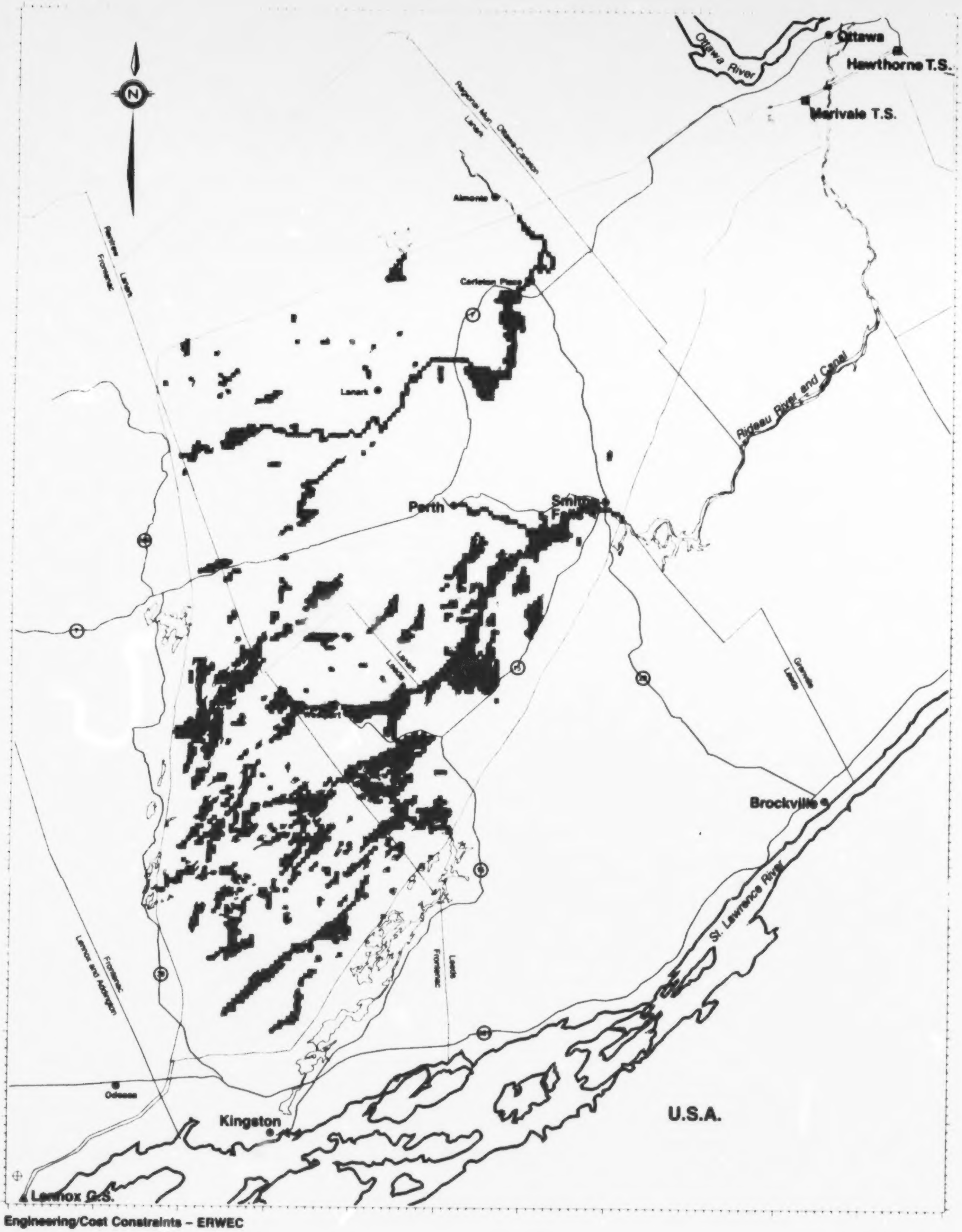
Lennox G.S.

Recreation Resources – ERWRR

Legend

- ■ Federal, provincial and conservation area parks
- ■ The viewshed of the Rideau Canal System and Westport Mountain
- ■ Existing private/commercial/public facilities
- ■ Viewsheds of cottage lakes
- ▨ Viewsheds of designated linear recreation features
- ▨ Provincial park/conservation area reserves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Engineering/Cost Constraints – ERWEC

Legend

■ Lakes and major navigable waterways

░ Sensitive/unique geologic features

APPENDIX B.5

OBJECTIVE RATINGS AND CONSTRAINT LEVELS

- B.5.1 RATING CRITERIA
- B.5.2 SUMMARY - LEVEL OF IMPORTANCE (RESOURCE VALUE)
- B.5.3 SUMMARY OF POSSIBLE EFFECTS
- B.5.4 OVERALL RATING

B5.1 Rating Criteria

POSSIBLE EFFECTS

1. Low

- minimal direct effect, no indirect effect
- localized extent of effect
- low intensity of effect
- short duration of effect
- low frequency of effect
- "Construction and Site Restoration Guidelines" capable of mitigating effects on site

2. Moderately Low

- moderate direct effect, no indirect effect
- localized extent of effect
- moderate intensity of effect
- short duration of effect
- low frequency of effect
- "Construction and Site
- Restoration Guidelines" capable of mitigating effects on-site

3. Moderate

- moderate direct effect, low indirect effect
- localized extent of effect
- moderate intensity of effect
- intermediate duration of effect
- moderate frequency of effect
- "Construction and Site Restoration Guidelines" capable of mitigating effects on-site

RESOURCE VALUE

1. Low

- low relative resource importance
- high resource prevalence
- low sensitivity of resource to change
- low probability of land use affection or resource depletion

2. Moderately Low

- moderate relative resource importance
- random resource prevalence
- moderate sensitivity of resource to change
- low probability of land use affection or resource depletion

3. Moderate

- moderate relative resource importance
- selective or site specific resource prevalence
- moderate sensitivity of resource to change
- moderate probability of land use affection or resource depletion

POSSIBLE EFFECTS (Cont'd)

4. High

- high direct effect, moderate to high indirect effect
- widespread extent of effect
- moderate intensity of effect
- intermediate duration of effect
- high frequency of effect
- few remedial measures available or irreversible effect

5. Very High

- high direct effect, moderate to high indirect effect
- widespread extent of effect effect or extinction of the resource
- high intensity of effect
- long duration of effect
- high frequency of effect
- few remedial measures available or irreversible effect

RESOURCE VALUE (Cont'd)

4. High

- high relative resource importance
- selective or site specific resource prevalence
- high sensitivity of resource to change
- high probability of land use affection or resource depletion

5. Very High

- high relative resource importance
- rare/unique resource or site specific occurrence
- high sensitivity of resource to change
- high probability of extensive land use affection or resource extinction

Appendix B.5.2

EASTERN ONTARIO ROUTE STUDY - WEST SECTION

Summary - Level of Importance (Resource Value)

Date December 14 1982

Revision 1

Legend
1 Low
2 Moderately Low
3 Moderate
4 High
5 Very High

Factor / Objectives to Avoid	Agriculture Resources: Specialty crop production areas and CLI soil capability class 1 agr. land	CLI soil capability classes 2, 3 agr. land	CLI soil capability class 4 agr. land	CLI soil capability classes 5, 6 agr. land	Appearance Of The Landscape: Landscapes characterized by high ...	Viewsheds of existing settlements	Landscapes characterized as ...	Ridge farm landscapes	Biological Resources: Biological areas considered to be rare ...	Biologically significant wetlands	Fish and wildlife protection areas	Deer winter concentration areas	Cold and warm water fisheries	Waterfowl habitat	Wetlands with no identified ...	Forest Resources: Experimental forest areas and major ...	Intensive management forest areas	Productive forest lands with ...	Productive forest lands with ...	Productive forest lands with ...	Heritage Resources: Confirmed archaeological sites	Potential archaeological sites and areas	Representative cultural landscapes	Human Settlement: Existing urban settlements	Existing rural strip developments	Existing institutional, commercial and industrial ...	Approved residential and cottage developments	Mineral Resources: **Active quarries**	Active pits	Geologic sites and features with recognized value	Areas of high sand and gravel reserve and industrial mineral potential	Recreation Resources: Federal, provincial and conservation area parks	The viewshed of the Rideau Canal System and Westport Mountain	Existing private commercial and public recreation facilities	Viewsheds of cottage lakes	Viewsheds of designated linear recreation features	Provincial park and conservation area reserves	Engineering Cost Constraints: Lakes and major navigable waterways	Sensitive unique geologic features
Advisory Group Members																																							
Ronald Black Kingston Field Naturalists	1	1	3	3	5	3	3	2	5	5	5	3	3	4	5	4	5	2	2	2	3	3	3	5	4	2	4	1	1	4	1	5	3	2	3	1	5	1	1
Nigel Brereton Regional Municipality of Ottawa Carleton	4	4	3	2	3	1	2	1	5	3	5	4	3	4	1	4	3	2	2	1	4	3	1	5	4	3	4	4	4	3	4	5	3	4	2	1	4	4	4
John Brus North Leeds Planning Board	5	5	4	2	4	4	2	3	5	4	4	5	4	5	3	5	5	4	3	3	5	3	4	5	5	3	4	5	5	2	3	5	5	4	5	4	3	5	5
Cliff Craig Rideau Valley Conservation Authority	5	4	2	1	4	2	2	2	5	4	4	5	4	4	3	4	4	4	3	1	5	4	3	5	4	2	3	4	4	3	3	5	5	4	3	4	5	5	4
Jim Earl National Farmer's Union	5	5	4	3	3	4	2	3	5	5	4	3	5	3	5	4	5	5	4	1	5	5	5	5	3	5	4	1	5	3	4	5	5	5	5	1	5	5	5
Tec Frans Leeds County OFA	5	3	2	2	5	5	3	4	5	4	4	3	5	4	3	5	3	4	4	3	5	4	5	5	4	4	5	*	3	3	2	5	5	4	5	4	5	4	5
Richard Fraser Ottawa-Carleton OFA	5	5	5	4	3	2	3	3	4	3	3	4	3	2	2	5	4	2	3	1	4	3	3	5	3	4	3	4	4	3	3	3	4	4	3	3	2	5	3
Bruce Guthrie AMEU Perth P.U.C.	4	4	3	3	3	2	3	3	5	3	5	3	3	3	3	4	3	2	2	2	5	5	4	5	5	5	4	1	2	3	2	4	5	4	4	2	4	4	5
Arne Henrikson Rideau Trail Association	4	5	2	1	5	4	3	1	5	5	3	3	1	3	5	5	5	4	3	2	4	4	2	5	3	2	4	2	4	3	4	5	5	4	4	5	5	5	3
Helen Henrikson Little Cataraqui Environmental Association	5	4	3	2	5	3	3	3	5	5	5	4	3	4	3	5	3	3	3	1	5	3	4	5	4	4	2	3	2	3	2	5	5	4	4	3	4	5	5
Bill Hiscock Ministry of Natural Resources	4	4	3	2	3	2	3	3	5	4	4	4	4	4	2	4	4	4	4	4	5	3	3	5	4	4	3	4	4	4	3	4	5	4	4	3	3	4	3
Ron Holman Central Rideau Planning Board	5	5	2	2	3	5	3	4	5	4	5	4	4	4	3	4	4	3	3	3	4	4	4	5	5	3	5	2	3	4	3	5	5	5	5	5	5	5	5
Ron Holmes Ministry of Tourism & Recreation	4	4	5	2	4	4	4	3	5	3	4	5	3	3	1	5	4	3	3	1	5	4	3	5	4	5	4	3	4	4	4	5	5	5	4	5	5	5	5
Mike Holy Ministry of the Environment																																							
Clyde C. Kennedy Ontario Archaeological Society	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	*	5	5	5	5	5	5	5	5	5	5	5
Wendy Laut Hydro Consumers Association	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Gerrit Leeflang Lanark County, OFA	3	4	4	4	2	3	3	3	2	2	3	4	2	2	1	4	2	3	3	3	3	3	3	5	4	4	2	4	4	3	3	4	4	3	3	3	3	4	4
Keith Leonard Frontenac County South	5	5	4	1	1	3	2	4	5	2	5	5	4	4	5	5	5	5	4	3	5	2	3	5	4	4	5	4	5	2	3	5	4	2	3	2	2	5	3
Glenn Lockwood Ontario Historical Society	3	3	2	2	5	4	5	5	4	5	4	4	3	3	1	4	4	3	3	1	5	5	5	4	5	4	5	3	4	5	4	5	5	5	5	4	5	5	5
Keith Matthie Institute of Agrologists	5	5	5	3	3	2	3	2	3	3	3	3	3	3	3	4	4	4	4	2	3	2	2	5	3	3	3	5	5	3	4	4	5	3	3	3	2	5	3
Ed Murphy AMEU Ottawa Hydro	4	3	1	1	3	3	2	1	4	2	2	4	1	2	2	4	4	2	3	1	4	2	1	5	3	4	2	5	4	2	3	4	3	4	3	2	2	4	5
Herb Norry OMAF	5	5	5	3	3	3	3	3	4	3	3	4	3	3	2	4	3	3	3	1	4	4	4	5	4	5	4	4	5	3	4	4	4	4	3	3	3	4	3
Joyce Reddoch Ottawa Field Naturalists	5	4	3	1	5	4	4	4	5	5	5	5	5	5	5	4	1	2	1	3	5	5	5	5	4	3	1	3	3	5	3	5	5	3	5	5	5	5	3
John Sheil North Lanark Planning Board	5	5	4	2	3	3	3	3	3	2	4	3	3	2	2	5	3	2	3	2	3	3	3	5	5	4	3	3	4	3	3	4	5	5	3	3	3	5	5
Bert Shingler Federation of Ontario Cottagers	5	4	3	2	2	5	3	4	5	4	4	4	2	3	1	5	4	4	3	2	5	4	3	5	4	4	4	4	4	3	3	5	4	4	4	3	3	5	4
Carol Groenewegen Frontenac County, OFA	5	5	3	1	1	3	1	4	4	2	4	5	3	2	1	5	5	4	3	1	5	3	3	5	4	4	5	4	5	3	4	5	5	4	3	3	3	5	5
Barbara Sproule Frontenac County North	5	5	3	3	1	1	2	4	5	3	3	2	3	2	1	5	4	3	3	1	5	3	3	5	4	4	4	2	4	3	4	5	4	4	3	3	3	5	5
Bill Stephenson Parks Canada	4	2	2	1	5	5	3	2	5	5	5	5	2	4	5	5	2	2	2	1	5	4	5	5	3	2	4	*	1	1	1	5	5	3	3	4	5	5	3
Bob Strachan Lanark County	4	3	2	2	3	4	2	3	4	3	2	3	3	2	2	3	4	2	3	2	4	3	4	5	5	4	5	4	2	3	2	4	5	4	4	4	4	5	5
Dave Symons National Capital Commission	4	3	2	1	3	3	3	3	5	3	4	3	1	4	1	5	4	4	3	3	5	3	3	5	3	2	4	2	4	4	2	5	5	4	3	3	5	-	-
Total	128	119	94	66	100	96	84	90	132	108	115	114	93	98	82	130	111	95	90	61	130	104	101	144	117	107	110	86	109	95	91	135	133	115	109	96	113	129	116
Average	4.4	4.1	3.2	2.2	3.4	3.4	2.9	3.1	4.6	3.7	4.0	3.9	3.2	3.4	2.8	4.5	3.8	3.3	3.1	2.1	4.5	3.6	3.5	5.0	4.0	3.7	3.8	3.3	3.8	3.3	3.1	4.7	4.6	4.0	3.8	3.3	3.9	4.8	4.1

* No rated score available

APPENDIX B.5.3

SUMMARY OF POSSIBLE EFFECTS

AGRICULTURAL RESOURCES

Possible Effects	AR1	AR2	AR3	AR4
Transmission facilities located in specialty crop areas and productive agricultural land may conflict with the Ontario Food Lands Guidelines.	Yes.	Yes.	Yes.	Less applicable.
The presence of towers in agriculture areas may affect the farming operations. Towers may reduce the operational efficiency or restrict the use of specialized machinery (i.e., high pressure irrigation, aircraft operations, specialized harvesting equipment). Land may be lost from production under, and adjacent to towers. The prevalence of row crops (i.e., corn) on CLI Class 1, 2 and 3 soils, and the large size of machinery associated with its cultivation, may result in problems in maneuvering machinery around towers without damaging the machinery or the crop being grown.	High to low direct and indirect effect, depending upon tower locations. Moderate to high degree of change. Long-term disruption associated with construction and operation of the line, with limited mitigation. Effects are confined to the right-of-way.	High to low and indirect effect, depending upon tower locations. Moderate to high degree of change. Long-term effect with limited opportunities for mitigation.	High to low and indirect effect, depending upon tower locations. Moderate degree of change. Long-term effect with limited opportunities for mitigation.	Low direct effect resulting from presence of facilities. Moderate to low degree of change. Long-term effect with limited opportunities for mitigation.
Construction activities may lead to soil compacting and rutting, and may result in damage to sub-surface drainage systems. This can cause a temporary reduction in in crop yield along access roads and near tower sites (depending on soil conditions at the time of construction).	High to low direct effect. Limited to access road and tower construction area. Short duration of effect. Mitigation measures available.	High to low direct effect. Limited to access road and tower construction area. Short duration of effect. Mitigation measures available.	High to low direct effect. Limited to access road and tower construction area. Short duration of effect. Mitigation measures available.	High to low direct effect. Limited to access road and tower construction area. Short duration of effect. Mitigation measures available.

AGRICULTURAL RESOURCES

Possible Effects	AR1	AR2	AR3	AR4
There may be loss of or damage to agricultural crops during construction.	High to moderate direct effect, confined to tower sites and access roads. The effects are long-term duration. High degree of change. No migitative measures available.	Moderate to low direct effect, confined to tower sites and access roads. The effects are short-term duration. Moderate to high degree of change. No mitigative measures available.	Moderate to low direct effect. The effects are short-term duration. Moderate degree of change. No mitigative measures available.	Moderate to low direct effect. The effects are short-term duration. Low degree to change. No mitigative measures available.
Rated Score	4.0	3.5	3.0	2.5

APPEARANCE OF THE LANDSCAPE

Possible Effects*	AL1	AL2	AL3	AL4
The presence of transmission facilities may result in a constrast in character and scale with other elements in the landscapes.	High to moderate indirect effect. High to moderate degree of change.	High to low indirect effect. High to very low degree of change.	Moderate indirect effect. High to moderate degree of change.	Moderate to low indirect effect. Moderate degree of change.
The presence of towers on crest may result in skylining of the facilities, which may be visible from a distance.	High direct and indirect effect. High degree of change.	High to moderate direct and indirect effect. High to low degree of change.	Moderate direct effect. Moderate to high indirect effect. Moderate to high degree of change.	Moderate direct effect. Moderate to low indirect effect. Moderate degree of change.
The removal of vegetation for the ROW may result in colour constrasts with surrounding areas. This constrast would be more pronounced in the winter.	Moderate direct effect. High indirect effect. High degree of change.	Moderate to low direct effect. High to moderate indirect effect. High to moderate degree of change.	Moderate direct effect. High to moderate indirect effect. High to moderate degree of change.	Moderate direct and indirect effect. Moderate degree of change.
Rated Score	3.5	3.0	3.0	2.5

* Note: All direct effects are limited to the right-of-way, while the indirect effects extend well beyond. All effects are long-term, and there are no effective remedial measures.

BIOLOGICAL RESOURCES Possible Effects	BR1	BR2	BR3	BR4	BR5	BR6	BR7
Transmission facilities may conflict with existing legislation (i.e., Endangered Species Act).	Yes.	Yes.	Yes.	No.	No.	No.	No.
Right-of-way clearing and construction activities may result in the removal of vegetative cover. As a result, there may be loss of floral and faunal species and habitat considered important to protect. This may encourage the influx of more aggressive and competitive species, or reduce the carrying capacity of the habitat.	High direct effect. Moderate to high indirect effect. Long duration of effect along and adjacent to the right-of-way. High to moderate risk of effect. Difficult to reverse the effects, leading to possible extinction.	High direct effect. Moderate to high indirect effect. Long duration of effect along and adjacent to the right-of-way. High to moderate risk of effect. Difficult to reverse the effects on flora and fauna	Moderate direct effect. Moderate to low indirect effect. Long duration of effect, but is limited to the right-of-way. Difficult to reverse the effects.	Moderate to moderately low direct effect. Long duration of effect, but is limited primarily to the right-of-way. Difficult to reverse the effects.	Low direct and indirect effect. Low risk of effect. Short duration of effect, and limited to the right-of-way. Numerous mitigative measures available.	Moderate to low direct effect. Low indirect effect. Short duration of effect, and limited to the right-of-way. Natural restoration of vegetative cover will mitigate effects.	Moderate direct effect. Moderate to low indirect effect. Long duration of effect along and adjacent to the right-of-way. Difficult to reverse the effects.

BIOLOGICAL RESOURCES (cont'd)	BR1	BR2	BR3	BR4	BR5	BR6	BR7
Possible Effects							
Construction activities during critical periods in the species annual cycle may adversely affect such activities as breeding, nesting, staging and spawning.	High direct effect. High to moderate indirect effect. Short duration of effect, but can be widespread. Few mitigative measures available.	High direct effect. High to moderate indirect effect. Short duration of effect, but can be widespread. Few mitigative measures available.	High direct effect. High to moderate indirect effect. Short duration of effect, but can be widespread. Few mitigative measures available.	Moderate to low direct effect. Low indirect effect. Short duration effect, but can be limited to the right-of-way. Naturally reversible, with the possibility for improving browse conditions.	Low direct effect. Low indirect effect. The direct effects are generally limited to the right-of-way, while the indirect effects can be widespread. Short duration of effect. Numerous mitigative measures available.	High direct effect. High to moderate indirect effect. Low risk of effect. Short duration of effect, but can be widespread. Mitigative measures available.	High direct effect. High to moderate indirect effect. Short duration of effect, but can be widespread. Few mitigative measures available.
There may be an alteration in known ecological diversity, which cannot otherwise be duplicated.	High direct effect. Long duration of effect, but is limited primarily to the right-of-way. Moderate risk of effect because of the large size of many of the features. No mitigative measures available.	Moderate direct effect. Long duration of effect, but is limited primarily to the right-of-way. Moderate to low risk of effect because of the large size of many of the features. No mitigative measures available.	Moderate direct effect. Moderate to low indirect effect. Long duration of effect, but is limited primarily to the right-of-way. Moderate risk of effect. No mitigative measures available.	Low to moderate direct effect. Long duration of effect, but is limited primarily to the right-of-way. Low risk of effect because of the large size of many of the features. No mitigative measures available.	Low direct effect. Low risk of effect.	Low direct effect. Low risk of effect.	Moderate to low direct effect. Long duration of effect, but is limited primarily to the right-of-way. Low risk of effect since many of these wetlands are untreed. No mitigative measures available.

BIOLOGICAL RESOURCES (cont'd)	**BR1**	**BR2**	**BR3**	**BR4**	**BR5**	**BR6**	**BR7**
Possible Effects							
ROW clearing and access road construction may facilitiate increased human pressure upon the resource by opening up the biological area.	Low direct effect. Moderate to high indirect effect. Long duration of effect, but can be widespread. High risk of effect. Few mitigative measures available.	Low direct effect. Moderate indirect effect. Moderate risk of effect. Long duration of effect. Few mitigative measures available.	Not applicable.	Low direct effect. Moderate indirect effect. Low risk of effect. Long duration of effect. Few mitigative measures available.	Not applicable.	Low direct effect. Moderate indirect effect. Low risk of effect. Long duration of effect. Few mitigative measures available.	Low direct effect. Low indirect effect. Low risk of effect. Long duration of effect. Few mitigative measures available.
Rated Score	4.5	4.0	3.5	3.0		2.5	3.0

FOREST RESOURCES	FR1	FR2	FR3	FR4	FR5
Possible Effects					
Trees will be removed to provide space for the right-of-way and access roads. (All remaining possible effects listed occur indirectly.)	High direct effect. Long duration of effect, confined to the right-of-way. No mitigation measures available.	High direct effect. Long duration of effect, confined to the right-of-way. No mitigation measures available.	High direct effect. Long duration of effect, confined to the right-of-way. No mitigation measures available.	High direct effect. Long duration of effect, confined to the right-of-way. No mitigation measures available.	Moderate direct effect. Shorter duration of effect. Mitigative measures, such as selective cutting, available.
Transmission facilities may interfere with forest research and maple sugar production. The loss of experimental areas for research may terminate specific studies before results and conclusions are obtained. This may result in a waste of monetary investment and a retardation of forrest research. It may also inhibit maple sap collection (i.e., the pipeline and plastic tubing).	High indirect effect. Long duration of effect that is confined to the right-of-way. No mitigative measures available.	Not applicable.	Not applicable.	Not applicable.	Not applicable.
Transmission facilities may interfere with the forest management activities (i.e., spraying and harvesting) and the raw material supply.	Moderate effect. Long duration of effect, and widespread. Mitigative measures available.	Moderate effect. Long duration of effect, limited to the right-of-way. Remedial measures (i.e., special compatible crops - Christmas trees) available.	Moderate effect. Long duration of effect, limited to the right-of-way. Remedial measures (i.e., special compatible crops) available.	Moderate effect. Long duration of effect, limited to the right-of-way. Remedial measures available.	Moderate effect. Short duration of effect. There is native species regeneration possible.

FOREST RESOURCES (cont'd)	FR1	FR2	FR3	FR4	FR5
Possible Effects					
Cutting would contravene contracts (Woodlands Improvement Act and Agreement Forest Act) between government and individuals or public agencies.	Not applicable.	Yes.	Not applicable.	Not applicable.	Not applicable.
Rated Score	4.5	4.0	3.5	3.5	3.0

HERITAGE RESOURCES

Possible Effects	HR1	HR2	HR3
Transmission lines located on confirmed archaeological sites may conflict with provincial heritage legislation (Ontario Heritage Act, 1974).	Yes.	Yes. If the site is confirmed, it would be considered under HR1.	No.
The appearance of the surrounding landscape may be an integral part of a historical/archaeological site or cultural landscape. Hydro transmission facilities may permanently alter this character, and may be considered incompatible.	Moderate to low direct effect in terms of changes to the physical landscape which results in a moderate to high indirect effect, that is the perception that transmission lines are out of character with the historical development. The physical changes are confined to the right-of-way but the perceptual changes will affect the surrounding area, depending on the landscape character. All changes are long-term but are only moderate to low intensity. No mitigative measures.	Low direct effect with a low to moderate indirect effect. The physical changes are confined to the right-of-way but the perceptual changes will affect a larger area, depending on the landscape character. The changes are long-term but are only moderate to low intensity. No mitigative measures.	Moderate to low direct effect with moderate to low indirect effects. The physical changes are confined to the right-of-way but the perceptual changes will affect any larger area, depending on the landscape character. The changes are long-term but are only moderate to low intensity. No mitigative measures.

HERITAGE RESOURCES (cont'd)

Possible Effects	HR1	HR2	HR3
It may be necessary to remove and/or relocate historic buildings from the transmission right-of-way. This may result in loss of historical knowledge and/or educational opportunities.	High direct effect with a moderate to high indirect effect. Long-term change. High degree of change for the direct effect and moderate to low degree of change for the indirect effects. The degree of the effects can be reduced by mitigative measures.	Not applicable.	Moderate to low direct effect. Moderate indirect effect. Moderate degree of change. Long duration of change. Mitigation measures available.
Construction activities may disturb an archaeological site or destroy artifacts. This may result in loss of historical knowledge and/or educational opportunities.	High direct effect with a moderate indirect effect. Long-term change confined to the right-of-way. Mitigation measures are available that can reduce the intensity of effect.	Yes. If the site is confirmed, it would be considered under HR1.	Not applicable.
ROW and access roads may create new and uncontrolled access to potential, newly discovered or existing archaeological sites.	Low direct effect with a moderate to low indirect effect. Long-term change that is limited to the right-of-way access roads and adjacent areas. Moderate to low degree of change that can be reduced by mitigation measures.	Low direct effect with a moderate to low indirect effect. Long-term change that is limited to the right-of-way access roads and adjacent areas. Low degree of change that can be reduced by mitigation measures.	Not applicable.
Rated Score	3.5	2.5	2.0

HUMAN SETTLEMENT	HS1	HS2	HS3	HS4
Possible Effects				
Transmission facilities may conflict with officially stated and/or aproved land use policies.	Yes.	Yes.	Yes.	Yes.
Existing structures or facilities may be removed.	High direct effect. High indirect effect. High risk of effect. Long duration of effect, but is restricted to the right-of-way. No mitigation available.	High direct effect. High indirect effect. High risk of effect. Long duration of effect, but is restricted to the right-of-way. No mitigation available.	High direct effect. High indirect effect High risk of effect. Long duration of effect, but is restricted to the right-of-way. Few mitigative measures available.	Moderate indirect effect. Moderate risk of effect that is long-term, but is restricted to the right-of-way area. No mitigation available.
During the construction phase, noise, dust, and other inconveniences may result for short periods of time.	Moderate effect. Low risk of effect. Most of these effects can be mitigated.	Moderate effect. Low risk of effect. Most of these effects can be mitigated.	Low effect. Low risk of effect. Most of these effects can be mitigated.	Not applicable.
There may be effects on existing or future land use patterns and developments. Transmission facilities may create a barrier to expansion or hinder the planned development of the land and may reduce the number of available lots as designated.	High direct effect. Moderate to high indirect effect. High risk of effect. Long duration of effect, and limited to the right-of-way. The indirect effects occur mostly in areas adjacent. No mitigation measures available.	High direct effect. Moderate to high indirect effect. High risk of effect. Long duration of effect. No mitigation measures available.	High to low direct effect. Low indirect effect. Moderate risk of effect. Long duration of effect. No mitigation measures available.	High direct effect. Moderate indirect effect. Moderate risk of effect. Short duration of effect. Few mitigation measures possible.

HUMAN SETTLEMENT (cont'd)	HS1	HS2	HS3	HS4
Possible Effects				
Signals to and from certain communication towers may be adversely affected by the presence of transmission facilities.	Not applicable.	Not applicable.	Wide variability of direct effect - depending on the type of facility.	Not applicable.
The presence of transmission facilities may alter the visual character of neighbourhoods.	High indirect effect. High degree of change. Long duration of effect. No mitigation measures available.	High indirect effect. High degree of change. Long duration of effect. No mitigation measures available.	High indirect effect. High degree of change. Long duration of effect. No mitigation measures available.	Moderate to low indirect effect. Moderate to low degree of change. Long duration of effect. No mitigation measures available.
Rated Score	4.5	4.5	4.0	3.5

MINERAL RESOURCES	MR1	MR2	MR3	MR4
Possible Effects				
Transmission facilities may conflict with officially stated and/or approved designated areas for active extraction and planned operations.	Yes.	Yes.	Not applicable.	Yes.
Transmission facilities may conflict with designated earth science or environmental protection areas.	Not applicable.	Not applicable.	Yes.	Not applicable.
Transmission facilities restrict exploitation of a limited, non-renewable, natural resource. The location of transmission facilities on or adjacent to pit and quarry sites may preclude normal extractive procedures, such as blasting, thus decreasing the viability of the operation There may be an interference with ongoing operations through a general loss of efficiency. Indirect effects that may result are increased marketing costs resulting from interference with vehicular traffic and machinery. This may result in a loss of economic potential and may increase marketing costs. It may become necessary to develop reserves farther from the demand centres.	High direct effect. Moderate indirect effect. High risk of effect. Long-term restriction to resource extraction with few remedial measures. The direct effects are limited to the right-of-way and adjacent areas.	Moderate direct effect. Moderate to low indirect effect. High risk of effect. Long-term restriction to resource extraction with few remedial measures. The direct effects are limited to the right-of-way, the indirect effects are widespread.	Not applicable.	Low direct effect, low indirect effect. Moderate risk of effect. Long-term restriction on resource extraction, but limited to the right-of-way. Remedial measures are available.

MINERAL RESOURCES (cont'd)

Possible Effects	MR1	MR2	MR3	MR4
Construction activities may result in the destruction of unique/sensitive geologic or earth science sites, or may protect the features from competing land uses, depending upon the size of the feature and the tower location.	Not applicable.	Not applicable.	Wide range of direct effects. Moderate indirect effect through the loss of scientific or educational value. Wide variability in the degree of change. Long duration of effect, but limited to the right-of-way. There are mitigative measures available.	Not applicable.
Rated Score	4.0	3.0	2.5	2.5

RECREATIONAL RESOURCES	RR1	RR2	RR3	RR4	RR5	RR6
Possible Effects						
New transmission lines will conflict with the policies of the regulatory agencies.	Yes.	Yes.	Not applicable.	Not applicable.	Not applicable.	Yes.
Recreational experiences may be altered through changes in the appearance of the landscape resulting from such direct effects as the removal of vegetation, cresting, and the presence of the towers.	High to moderate direct effect. High indirect effect. The direct effects are limited to the right-of-way. but the indirect effects occur far beyond the right-of-way. High degree of change that is long-term. There are no effective remedial measures.	High to moderate direct effect. High indirect effect. The direct effects are limited to the right-of-way. but the indirect effects occur far beyond the right-of-way. High degree of change that is long-term. There are no effective remedial measures.	Moderate to low direct and indirect effect. The direct effects are limited to the right-of-way. but the indirect effects occur far beyond the right-of-way. Moderate to low cdegree of change that is long-term. There are no effective remedial measures.	High to moderate direct and indirect effect The direct effects are limited to the right-of-way. but the indirect effects occur far beyond the right-of-way. High to moderate degree of change that is long-term. There are no effective remedial measures.	Moderate direct effect. Moderate to low indirect efect. The direct effects are limited to the right-of-way. but the indirect effects occur far beyond the right-of-way. Moderate to low degree of change that is long-term. Most occurrences will be of short duration. There are some remedial measures	Not applicable.

RECREATIONAL RESOURCES (cont'd)	RR1	RR2	RR3	RR4	RR5	RR6
Possible Effects						
There may be a loss of facilities (campsites, buildings) or resources upon which certain recreational activities depend, particularly interpretive programs.	High direct effect. Moderate indirect effect. High degree of change that is long-term and limited to the right-of-way. Mitigation measures available.	Not applicable.	high direct effect. Moderate to high indirect effect. High degree of change that is long-term and limited to the right-of-way. Mitigation measures available.	Not applicable.	Not applicable.	Moderate to low direct effect. Little indirect effect. Moderate to low degree of change that is long-term. The changes are limited to the right-of-way. No remedial measures available.
Transmission lines may interfere with, or inhibit, activities by forming artificial barriers. As a result, there may be a loss of development potential.	Moderate to low direct and indirect effects. The interference with activities will occur only on the right-of-way, while the other effects may occur in adjacent areas. Moderate to low degree of change that is long-term. There are no remedial measures available.	Not applicable.	Moderate direct and indirect effects. The interference with activities will only occur on the right-of-way, while the other effects may occur in adjacent areas. Moderate to low degree of change that is long-term. There are no remedial measures available.	Not applicable.	Not applicable.	Long-term interference with resource utilization.
Rated Score	4.5	4.0	3.5	3.5	3.0	2.5

B.5.4 OVERALL RATING

Eastern Ontario Route Study - West Section
Overall Rating

Date Dec 14, 1982
Revision 1

Factor	Objectives to Avoid	Importance Rating (Resource Value) (RV)	Possible Effects Rating (PE)	Overall Rating (RV x PE)
Agricultural Resources	• Specialty crop production areas and CLI soil capability class 1 in agriculture	4.4	4.0	17.6
	• CLI soil capability classes 2, 3 in agriculture	4.1	3.5	14.4
	• CLI soil capability class 4 in agriculture	3.2	3.0	9.6
	• CLI soil capability classes 5, 6 in agriculture	2.3	2.5	5.8
Appearance Of The Landscape	• Landscapes characterized by high hills	3.4	3.5	11.9
	• Viewsheds of existing settlements	3.4	3.0	10.2
	• Landscapes characterized as hilly	2.9	3.0	8.7
	• Ridge farm landscapes	3.1	2.5	7.8
Biological Resources	• Biological areas considered rare, unique, sensitive or significant	4.6	4.5	20.7
	• Biologically significant wetlands	3.7	4.0	14.8
	• Fish and wildlife protection management areas	4.0	3.5	14.0
	• Deer winter concentration areas	3.9	3.0	11.7
	• Cold and warm water fisheries	3.2	3.0	9.6
	• Waterfowl habitat	3.4	2.5	8.5
	• Wetlands with no identified biological information	2.8	3.0	8.4
Forest Resources	• Experimental forest areas and maple sugar bush operations	4.5	4.5	20.3
	• Intensive management forest areas	3.8	4.0	15.2
	• Productive forest lands with valuable species of mature or all-aged stands	3.3	3.5	11.6
	• Productive forest lands with valuable species of immature or young stands	3.1	3.5	10.9
	• Productive forest lands with intermediate value and low value species of all ages	2.1	3.0	6.3
Heritage Resources	• Confirmed archaeological sites, known historical routes and sites	4.5	3.5	15.8
	• Potential archaeological sites and areas	3.6	2.5	9.0
	• Representative cultural landscapes	3.5	2.0	7.0
Human Settlement	• Existing urban settlements	5.0	4.5	22.5
	• Existing rural strip developments and cottage developments	4.0	4.5	18.0
	• Existing institutional, commercial and industrial facilities	3.7	4.0	14.8
	• Approved residential and cottage developments	3.8	3.5	13.3
				11.4
Mineral Resources	• Active quarries	3.3	4.0	13.2
	• Active pits	3.8	3.0	11.8
	• Geologic sites and features with recognized value	3.3	2.5	8.3
	• Areas of high sand and gravel reserve and industrial mineral potential	3.1	2.5	7.8
Recreation Resources	• Federal, provincial and conservation area parks	4.7	4.5	21.2
	• The viewshed of the Rideau Canal System and Westport Mountain	4.6	4.0	18.4
	• Existing private commercial public recreation facilities	4.0	3.5	14.0
	• Viewsheds of cottage lakes	3.8	3.5	13.3
	• Viewsheds of designated linear recreation features	3.3	3.0	9.9
	• Provincial park and conservation area reserves	3.9	2.5	9.8
Engineering Cost Constraints	• Lakes and major navigable waterways	4.6	4.5	20.7
	• Sensitive unique geologic features	4.1	4.5	18.5

APPENDIX B.6

SOCIO-ECONOMIC DATA

B6.1 Socio-Economic Study Area

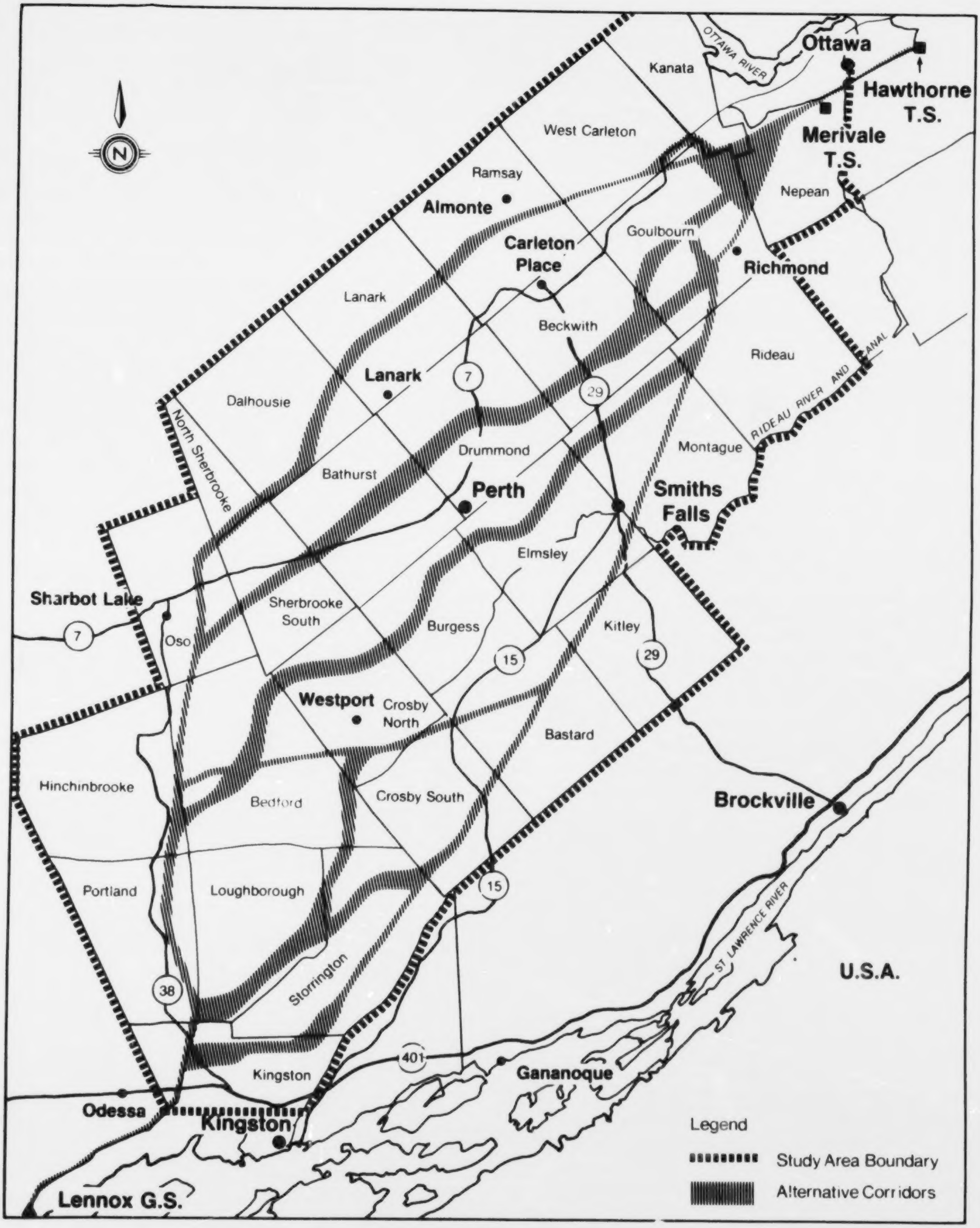
B6.2 Socio-Economic Statistics

B6.3 Socio-Economic Bibliography

B6.4 Lifestyle Considerations

B6.5 Socio-Economic Route Evaluation Criteria

B6.6 Socio-Economic Route Comparison Tables


Ottawa
Hawthorne T.S.
Merivale T.S.
Ottawa River
Kanata
West Carleton
Ramsay
Almonte
Nepean
Goulbourn
Carleton Place
Richmond
Lanark
Beckwith
Rideau
Lanark
7
29
Dalhousie
North Sherbrooke
Rideau River and Canal
Drummond
Montague
Bathurst
Perth
Smiths Falls
Elmsley
Sharbot Lake
Sherbrooke South
Burgess
Kitley
7
Oso
15
29
Westport
Crosby North
Bastard
Hinchinbrooke
Bedford
Crosby South
Brockville
Portland
Loughborough
15
St Lawrence River
U.S.A.
Storrington
38
401
Gananoque
Kingston
Odessa
Kingston
Lennox G.S.
Legend
Study Area Boundary
Alternative Corridors

B6.1

Socio-economic Study Area

APPENDIX B6.2

Socio-Economic Statistics

Table 1 Population change of townships in the Eastern Ontario Route Stage - West Study Area, 1971-1981

Population	Total Population			Population Change (%)	
Townships	1971	1976	1981	1976-1981	1971-1976
Nepean	64,159	76,892	84,361	+10%	19%
Kanata	-	13,058	19,728	+51%	-
West Carleton	-	8,904	9,929	+12%	-
Goulbourn	5,333	8,761	9,559	+ 9%	+64%
Rideau	-	8,677	9,052	+ 4%	-
Ramsay	1,880	2,103	2,518	+20%	+12%
Beckwith	1,533	2,358	2,844	+21%	+54%
Montague	2,338	3,669	3,689	+.5%	+57%
Lanark	782	898	1,084	+21%	+15%
Drummond	1,670	1,949	2,144	+10%	+17%
North Elmsley	1,464	1,954	2,118	+ 8%	+33%
South Elmsley	1,354	1,994	2,525	+27%	+47%
Kitley	1,791	1,792	1,932	+ 8%	0%
Lavant, Dalhousie & North Sherbrooke	933	1,056	1,148	+ 9%	+13%
Bathurst	1,986	2,262	2,437	+ 8%	+14%
North Burgess	571	608	664	+ 9%	+ 6%
Bastard & South Burgess	2,263	2,314	2,386	+ 3%	+ 2%
South Sherbrooke	436	565	519	- 8%	+30%
North Crosby	620	673	728	+ 8%	+ 8%
South Crosby	1,353	1,467	1,474	+.4%	+ 8%
Oso	1,177	1,344	1,269	- 6%	+14%
Bedford	723	810	767	- 5%	+12%
Storrington	2,434	2,776	2,993	+ 8%	+14%
Hinchinbrooke	1,131	1,165	1,085	- 7%	+ 3%
Portland	3,568	4,057	4,111	+ 1%	+14%
Loughborough	2,429	3,083	3,310	+ 7%	+27%
Kingston	16,377	24,737	27,960	+13%	+51%
Province of Ontario	7,703,100	8,264,400	8,625,000	+ 4%	+ 7%

Source:
- Statistics Canada. 1981. Selected population, dwelling, household and census family characteristics, for Census Divisions and Subdivisions.
- Ontario Department of Municipal Affairs. 1982. 1982 Municipal Directory.

Table 2 Seasonal population characteristics of townships within Eastern Ontario Route Stage - West Study Area

Township	No. Cottagers	% Total 1981 Township Population	Origin	Communities Affected
Kingston	0			
Loughborough	510	15%	30% U.S., 60% Kingston, 10% Toronto & Ottawa	Sydenham, Perth Road Village
Portland	200	5%	Toronto, Kingston, some U.S.	-
Hinchinbrooke	400	37%	Toronto, Kingston, Ottawa some U.S.	Parham, Godfrey
Storrington	900	30%	50% U.S., 40% Kingston, 10% Toronto & Ottawa	Battersea, Inverary, Sunbury
Bedford	2,200	280%	30% Kingston, 30% Toronto & Ottawa, 30% U.S., 10% international	Westport, Verona, Parham
Oso	380	30%	70% U.S., 20% Ottawa, 10% Toronto	Sharbot Lake
South Crosby	1,030	70%	30% Ottawa, 30% U.S., 25% Toronto, 15% Kingston	Jones Falls, Chaffey's Locks, Lanark, Elgin
North Crosby	700	96%	Ottawa, some U.S.	
South Sherbrooke	497	60%	Ottawa, few U.S.	Perth, Lanark
Bastard/South Burgess	1,200	50%	50% Ottawa, 20% Kingston 15% Toronto, 15% U.S.	Portland, Delta
North Burgess	1,200	200%	Ottawa	Perth
Bathurst	647	27%	Ottawa, some U.S.	Perth, Lanark

Table 2 (Continued)

Township	No. Cottagers	% Total 1981 Township Population	Origin	Communities Affected
Lavant, Dalhousie North Sherbrooke	600	50%	Ottawa, Perth	MacDonald's Corners, Perth, Lanark
Kitley	30	2%	Ottawa	Toledo
North Elmsley	4,000	180%	Kingston, Ottawa, U.S.	-
South Elmsley	1,200	50%	Smith Falls, Ottawa, few U.S.	Perth, Smith Falls
Drummond	500	24%	Ottawa	Innisville, Carleton Place
Lanark	800	75%	Ottawa	Lanark, Perth
Montague	190	5%	Ottawa	Smith Falls
Beckwith	1,120	40%	Ottawa	Carleton Place
Ramsay	150	6%	Ottawa	Carleton Place
Rideau	0			
Goulbourn	0			
West Carleton	0			
Kanata	0			
Nepean	0			

Source: Data were provided by township clerks and tax assessors.

Table 3 Population distribution - urban, rural and farm among townships in the Eastern Ontario Route Stage - West Study Area, 1981

Population Township	% Urban	% Rural	% Farm (% Total)	TOTAL
Nepean	86	14	.4	84,361
Kanata	85	15	2	19,728
West Carleton	0	100	16	9,929
Goulbourn	57	43	8	9,559
Rideau	30	70	11	9,052
Ramsay	0	100	26	2,518
Beckwith	0	100	12	2,844
Montague	28	72	9	3,689
Lanark	0	100	31	1,084
Drummond	0	100	26	2,144
North Elmsley	0	100	12	2,188
South Elmsley	0	100	7	2,525
Kitley	0	100	23	1,932
Lavant, Dalhousie & North Sherbrooke	0	100	20	1,148
Bathurst	0	100	20	2,437
North Burgess	0	100	24	664
Bastard & South Burgess	0	100	23	2,386
South Sherbrooke	0	100	19	519
North Crosby	0	100	30	728
South Crosby	0	100	14	1,474
Oso	0	100	24	1,269
Bedford	0	100	24	767
Storrington	0	100	13	2,993
Hinchinbrooke	0	100	20	1,085
Portland	0	100	14	4,111
Loughborough	0	100	9	3,310
Kingston	73	27	1	27,960
Province of Ontario	81.7	18.3	3.3	8,625,000

Source: Statistics Canada. 1981. Xeroxed Sheets (not catalogued).

Table 4 Age distribution of populations by township in the Eastern Ontario Route Stage - West Study Area, 1981

Age Groups	0-14 yr.		15-65 yr.		65 yr.		
Townships	No.	%	No.	%	No.	%	TOTAL
Nepean	19,403	23%	61,583	73%	3,374	4%	84,361
Kanata	6,313	32%	13,020	-66%	395	2%	19,728
West Carleton	2,483	25%	6,652	-67%	794	8%	9,929
Goulbourn	2,581	27%	6,404	-67%	574	6%	9,559
Rideau	2,353	26%	6,065	-67%	634	7%	9,052
Ramsay	655	26%	1,662	-66%	201	8%	2,518
Beckwith	654	23%	1,962	69%	228	8%	2,844
Montague	701	19%	2,730	74%	258	7%	3,689
Lanark	249	23%	694	64%	141	13%	1,084
Drummond	493	23%	1,394	65%	257	12%	2,144
North Elmsley	486	23%	1,395	66%	232	11%	2,113
South Elmsley	585	23%	1,695	67%	245	10%	2,525
Kitley	444	23%	1,256	65%	232	12%	1,932
Lavant, Dalhousie & North Sherbrooke	253	22%	746	65%	149	13%	1,148
Bathurst	487	20%	1,511	62%	439	18%	2,437
North Burgess	126	19%	465	70%	73	11%	664
Bastard & South Burgess	501	21%	1,551	65%	334	14%	2,386
South Sherbrooke	105	20%	340	65%	75	14%	520
North Crosby	146	20%	473	65%	109	15%	728
South Crosby	324	22%	929	63%	221	15%	1,474
Oso	279	22%	812	64%	178	14%	1,269
Bedford	138	18%	514	67%	115	15%	767
Storrington	718	24%	2,004	67%	269	9%	2,993
Hinchinbrooke	245	23%	700	65%	140	13%	1,085
Portland	1,028	25%	2,713	66%	370	9%	4,111
Loughborough	860	26%	2,185	66%	265	8%	3,310
Kingston	6,990	25%	19,572	70%	1,398	5%	27,960
Province of Ontario	1,887,000	22%	5,870,000	68%	868,000	10%	8,625,000

Source: Statistics Canada. 1981. Selected population, dwelling, household and census family characteristics, for Census Divisons and Subdivisions.

Table 5 Mother tongue by township in the Eastern Ontario Route Stage - West Study Area, 1981

Townships	English	French	German	Dutch	Italian	Chinese	Portugese	Ukranian	Spanish	Total
	Mother Tongue (%)									
Nepean	82	6	2	1	2	1			2	84,361
Kanata	87	5	1							19,728
West Carleton	92	4	1	1						9,929
Goulbourn	91	3	2	1	1					9,559
Rideau	91	3	1	1				1		9,052
Ramsay	95	2	1	1						2,518
Beckwith	94	3	1							2,844
Montague	93	5								3,689
Lanark	94	2	1							1,084
Drummond	97	1	1							2,144
North Elmsley	96	2	1	1						2,118
South Elmsley	96	2		1						2,525
Kitley	97	2		1						1,932
Lavant, Dalhousie & North Sherbrooke	96	1	1							1,148
Bathurst	97	1								2,437
North Burgess	96	1	1					1		664
Bastard & South Burgess	96	1	1	1						2,386
South Sherbrooke	94	3	1					1	1	519
North Crosby	98	1		1						728
South Crosby	98	1								1,474
Oso	98	1	1							1,269
Bedford	97	1						1		767
Storrington	96	1	2	1						2,993
Hinchinbrooke	98									1,085
Portland	97	1	1	1						4,111
Loughborough	97	1		1						3,310
Kingston	90	2	1	1	1		1			27,960
Province of Ontario	77	6	1	2	4	1	1	1	1	8,625,000

Numbers may not add due to rounding

Source: Statistics Canada. 1982. Population showing 30 mother tongues by Census Subdivisions, Census Divisions, Provinces and Canada, 1981. Uncatalogued.

Table 6 Agriculture statistics summary for Eastern Ontario Route Stage - West, 1981

	Eastern Ontario Route Study Area	Eastern Ontario Region[1]	Study Area as % of Region
Number Farms	3,327	12,905	25.8%
Total Farm Population	20,606	45,367	45.0%
Gross Value Argicultural Products[2]	$92,652,529	$443,572,813	20.9%
Total Capital Value[3]	$760,936,000	$3,226,713,000	23.6%
Total Value Wages to Labour	$6,156,616	$27,743,814	22.2%

[1] Includes: Renfrew, Lennox-Addington, Frontenac, Leeds-Grenville, Lanark, Ottawa-Carleton, Dundas, Stormont-Russell, Glengarry

[2] Seventy-five percent of the farms classified indicated that 51 percent or more of the total sales was dairy and cattle.

[3] Includes: buildings, land, machinery, equipment, livestock and poultry.

Sources: Ontario Ministry of Agriculture and Food. 1982. Agricultural Statistics for Ontario, 1981. Publication 20. Toronto, Ontario.

Line Numbers

B6.3 SOCIO-ECONOMIC BIBLIOGRAHY

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B6.4 Lifestyle Considerations

Five lifestyles were identified in the eastern Ontario study area. These lifestyles became obvious from discussions held at the MPCs and were substantiated through published statistics, existing documents, and subsequent interviews.

The population of the study area is primarily rural; however, there are urban dwellers, those who live and work in urban centres, in the Ottawa area and the Kingston area, the outer boundaries of the study area. Their activities in the study area are likely recreation-oriented: visiting friends or relatives or participating in outdoor recreation activities.

Resettlement from Ottawa into the rural areas is a common phenomenon in the non-urban areas of Kanata, Nepean, and Goulbourn Township as well as in the townships of West Carleton, Ramsay, Montague, and Rideau (Table 3). A similar phenomenon, but to a lesser scale, is occurring in the Kingston area with resettlement patterns obvious in the townships of Kingston, Loughborough, and to a lesser extent, Storrington. These ex-urbanites form part of the rural population but, unlike many of their neighbours, they are younger, better-educated, and have higher income jobs in the city. They bring with them urban values, tastes, and lifestyles. Their major motive for the move to the country is to pursue a rural lifestyle and of this lifestyle, they are very protective. There are often, however, incompatibilies between what the ex-urbanites perceive as rural life (that is, quiet and pastoral) and the realities of the commercial agriculture industry.

The farm population is another component of the rural population. It is, however, on the decline in eastern Ontario, having decreased about 16 percent since 1976. The continuing migration of farm populations to urban areas is primarily due to farm specialization, mechanization, and enlargement as well as the "cost-price squeeze" for agricultural products (McCrae, 1980). Those who farm in eastern Ontario, however, are engaged in traditional family farm enterprises on farm properties which tended to be somewhat smaller than the provincial average in 1981. These farmers support the feed mills, machinery dealers, and agricultural services located in the urban centres of Kingston, Perth and Smiths Falls.

Cottagers also form part of the rural population but on a seasonal basis. With the trend toward cottage conversion to retirement homes their influence could become quite strong. They are major contributors to the tourist dollars generated within the region as well as contributors to municipal tax revenues. Relative to the average Ontario household in 1978, cottagers were more highly educated, slightly older, earned higher incomes, and were more likely managers or professional people (Ross and Pack, 1979). The majority of cottagers in the study area reside in urban centres (Toronto, Ottawa, Kingston in this case) and reside at their cottages for mainly the summer months. Cottagers, generally, are very protective of their property and its natural setting and usually participate in cottagers' associations. These associations, at times, can be strong political lobbies. In general, cottagers own their family cottages an average of 15 years and based on discussions with the township clerks within the study area, have established good rapport with the permanent residents.

There are three distinct communities in the study area which encourage alternate lifestyles. All three communities were established on their current sites in the late 1960's to early 1970's. The three communities can be characterized as: pursuing a simple, non-consumptive lifestyle; espousing the conservation ethic; being environmentally aware; having a strong social conscience; and engendering trust within the community. None of the three communities are isolationist; they all rely on and contribute to the larger community within their area.

The Farm is a 50-member strong, intentional community located on a 225 ha site on the Mississippi River near MacDonald's Corners in Dalhousie Township. It is part of a network of communities which were spawned from The Farm in Summertown, Tennessee. The average age of the residents is 28 years, ranging from several months to 37 years, and the average residence time is 6 years. The main focus of The Farm is Plenty Canada, a non-profit, non-governmental, relief and development organization which promotes self-sufficiency through appropriate "village technologies". Projects are currently located in Guatemala, the Carribean, Lesotho, and Southern Mexico. With the exception of the Plenty Canada operation, the community is a collective in which all money earned through its Rapids General Contracting Company and through the Farm Foods and Book Company distributorship, mainly soya bean products, is pooled for community use. There is no bureaucracy, no rules or regulations; all decisions are made by committee.

The Brooke Valley community is a co-operative which sprang from the Peace Movement in the United States in the late 1960's. This 600 ha site is located on Concession 5 and 6 in Bathurst Township. The average age is 35, ranging from several months to 80 years, and the average residence time is 5 to 10 years. Unlike The Farm, each household functions indpendently but does share skills and equipment. Most members have built their own homes. The focal point of the community is the elementary school which operates on a one-room schoolhouse basis and provides education for 16 students in Grades 1 to 8.

Nature's Way (Ichthys Incorporated) is located on a 10 ha site near Burridge Lake in Bedford Township. It functions as a rehabilitative institute for families of drug addicts and for families with children with learning disabilities. The therapy has a strong Christian focus and is recreation-oriented. The emphasis is on working with the natural environment and developing social and communication skills. Seminars are scheduled on a monthly basis on such topics as wholistic health, inner healing, positive living, and organic gardening and a day camp is operated during the summer months. Nature's Way has developed a community network with approximately 20 cottage families and 30 local farmers who contribute their cottages/farms and are actively involved in its programmes as both volunteers and participants. Future plans include developing a "Futures Centre" on site and developing an exchange commodity network of 200 artisans within the adjacent community. To date, 35 percent of these artisans are participating in this network.

Information concerning The Farm, Brooke Valley and Nature's Way was obtained through interviews with J. Lee and S. Milwid, 25 community members from Brooke Valley and Dr. J. Loken, respectively.

APPENDIX B6.5

Socio-Economic
Route Evaluation Criteria

The criterion, ability to handle change, relates to the capability of the people within the townships in the study area to adapt to change (ie, new residential development, commercial or industrial development). The three indicators were age (ie, the young (less than 15 years) and the old (over 65 years) are less tolerant of change); population growth rate (ie, rate of population change from 1976 to 1981); and development orientation (ie, current orientation of townships to primarily residential development, as determined by planners from the Ministry of Municipal Affairs and Housing who are based in Ottawa). The premise is that young, fast-growing townships which officially encourage development are likely more receptive to change than older, slower-growing, less development-oriented townships.

The criterion, compatibility with the community, refers to the compatibility of transmission lines with the character of the community. Although few communities would encourage the presence of transmission lines, certain communities would be more amenable to transmission lines than others; for example, urban areas are likely more receptive to transmission lines than rural farm areas, than rural non-farm areas, than cottage areas, than rural estate areas, than areas with alternate lifestyles. As with all general statements; however, this criterion must be qualified on a case-by-case basis. This criterion was based on knowledge of the lifestyle involved and analysis of the responses of these various groups to the proposed transmission line. The indicators of this criterion were: percent of the township population that was urban, rural, and farm; percent of the township population that was cottagers; occurrence of rural residential properties; and percent of the 1981 total assessment that was commercial/industrial/business.

The criterion, economic base change, in a broad sense, reflects the relative economic change associated with each transmission route. The indicators were based on land use information obtained from the Land Use and Environmental Studies planners. The indicators relate to both the value of agricultural, forest and maple syrup sales loss associated with the respective losses of land and to municipal assessment losses associated with the removal of houses, farms, and businesses.[1] These indicators of economic change are gross estimates at best because the economic data were often only available on a per operator basis by township or a per hectare basis by township and the amount of land lost was calculated per hectare on a route sub-link basis and then approximated by township. Nonetheless, the data does, in a comparative sense, provide a perspective on the economic change associated with the routes.

The social/lifestyle change criterion refers to the qualitative changes, real or perceived, which could occur if transmission lines are built. Two indicators were used. The first, indicator changes to access, considered the extent to which the right of way would open up land to greater problems with trespassing or poaching. The second indicator, sense of community, attempted to describe changes to the character or use of a community which could occur as a result of the transmission lines. This may include communities which are divided by the line or which may experience some reduction in enjoyment of their community as a result of the line.

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[1] TRANSMISSION LINES DO NOT SIGNIFICANTLY INCREASE OR DECREASE THE MUNICIPAL TAX BASE. Most Ontario Hydro rights of way are acquired under easement and therefore the owner of the property continues to pay the property tax. If Ontario Hydro owns the right of way, then a realty payment-in-lieu (PIL) of taxes is made to the municipality. The assessment valuation for the PIL is based on the average assessment of adjacent property and is similar taxation procedure to that applied to railway or municipal public utility lands.

APPENDIX B6.6

Socio-Economic Route Comparison Tables

BLUE

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Kingston Twp	Younger	+13%	- pro residential development	73% 27% 1%	0% (rural resident)	36%	$2157	$193	$2142	$856	X
Portland Twp	Younger	+1%	- strong agriculture - some cottaging	0% 100% 14%	5%	8.6%	$1175	$179	$1766	$1178	$855
Hinchinbrooke Twp	Older	-7%	- low agriculture - rural - Hwy 38 development	0% 100% 20%	37%	4.7%	$1270	$41	$831	$483	$700
Bedford Twp	Older	-5%	- low agriculture - cottaging	0% 100% 24%	280%	1.5%	$3519	$80	$951	$1499	$1257
Oso Twp	Older	-6%	- strong cottaging - agriculture & aggregate strong	0% 100% 24%	30%	9.6%	$1283	$37	$681	$1297	$9099
Lavant, Dalhousie N. Sherbrooke Twp	Older	+8%	- rural - mistrust cottage - The Farm	0% 100% 20%	50%	2.6%	$1399	$57	$966	$5678	$8627
Lanark Twp	Younger	+21%	- agriculture - low cottage	0% 100% 21%	75%	1.5%	$1322	$136	$1546	$1469	$3986

BLUE (cont'd)

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Ramsay Twp	Younger	+20%	- strong agriculture - strong rural estate & resident	0% 100% 26%	6% (rural resident)	9%	$1411	$479	$2953	$523	$2208
West Carleton Twp	Younger	+12%	- strong agriculture - some resident	0% 100% 16%	0%	5.1%	N/A	$514	$3473	$1418	$909
Kanata	Younger	+51%	- urban & resident - pro development	85% 15% 2%	0%			X	$4475	X	X
Nepean	Younger	+10%	- urban development south - rural estate	86% 14% .4%	0% (rural resident)	25.6%	$1321	$682	$8125	$1431	X

Footnotes:

N/A = not available
X = confidential

1 Relative to provincial average.
2 Population growth in 1976 to 1981 period.
3 Farm population as percent of total township population, 1981.
4 Number of cottagers as percent of total township population, 1981.
5 From 1981 Financial Statements.
6 From 1981 Census of Agriculture.

RED

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Kingston Twp	Younger	+13%	- pro residential development	73% 27% 1%	0% (rural resident)	36%	$2157	$193	$2142	$856	X
Portland Twp	Younger	+1%	- strong agriculture - some cottaging	0% 100% 14%	5%	8.6%	$1175	$179	$1766	$1178	$855
Hinchinbrooke Twp	Older	-7%	- low agriculture - rural - Hwy 38 development	0% 100% 20%	37%	4.7%	$1270	$41	$831	$483	$700
Bedford Twp	Older	-5%	- low agriculture - cottaging	0% 100% 24%	280%	1.5%	$3619	$80	$951	$1499	$1257
Oso Twp	Older	-6%	- strong cottage also agriculture & aggregate	0% 100% 24%	30%	9.6%	$1283	$37	$681	$1297	$9099
S. Sherbrooke Twp	Older	-8%	- strong cottaging - agriculture low	0% 100% 19%	60%	7.3%	$1789	$48	$912	X	$7680
Bathurst Twp	Older	+8%	-residential outside Perth - agriculture - Brooke Valley	0% 100% 20%	27%	10.2%	$1000	$230	$1923	$4890	$4221

RED (cont'd)

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Drummond Twp	Older	+10%	- strong agriculture - some development from Perth - some cottaging	0% 100% 24%	24%	7.4%	$1315	$248	$2108	$2092	$2192
Beckwith Twp	Same	+21%	- rural, agriculture - strong Mississippi Lake	0% 100% 12%	40%	10.8%	$1194	$429	$2520	$2901	$582
Goulbourn Twp	Younger	+9%	- strong agriculture - poor planning	57% 43% 8%	0% (rural resident)	7.7%	$1174	$425	$4405	$947	X
Nepean	Younger	+10%	- urban development south - rural estate	86% 14% .4%	0% (rural resident)	25.6%	$1321	$682	$8125	$1431	X

Footnotes:

X = confidential

[1] Relative to provincial average.
[2] Population growth in 1976 to 1981 period.
[3] Farm population as percent of total township population, 1981.
[4] Number of cottagers as percent of total township population, 1981.
[5] From 1981 Financial Statements.
[6] From 1981 Census of Agriculture.

GREEN

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Kingston Twp	Younger	+13%	- pro residential development	73% 27% 1%	0% (rural resident)	36%	$2157	$193	$2142	$856	X
Portland Twp	Younger	+1%	- strong agriculture - some cottaging	0% 100% 14%	5%	8.6%	$1175	$179	$1766	$1178	$855
Hinchinbrooke Twp	Older	-7%	- low agriculture - rural - Hwy 38 development	0% 100% 14%	37%	4.7%	$1270	$41	$831	$488	$700
Bedford Twp	Older	-5%	- low agriculture - cottaging	0% 100% 24%	280%	9.6%	$1283	$80	$951	$1499	$1257
N. Crosby Twp	Older	+8%	- orient Rideau - hobby farms not strong agriculture	0% 100% 30%	96%	4.8%	$1971	$161	$1274	$1038	$3783
N. Burgess Twp	Older	+9%	- farm tradition - strong cottaging	0% 100% 24%	200%	1.3%	$2219	$141	$1730	X	X
N. Elmsley Twp	Same	+8%	- strong agriculture - orient to Perth	0% 100% 12%	180% (rural resident)	6.9%	$1166	$228	$2000	$2052	$1862

GREEN (cont'd)

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Montague Twp	Same	+.5%	- strong agriculture - rural estate	28% 72% 9%	5% (rural resident)	12.3%	$963	$198	$1813	$1647	X
Rideau Twp	Younger	+4%	- strong agriculture - strong rural estate	30% 70% 11%	0% (rural resident)	5.4%	$1253	$458	$4523	$849	$1158
Goulbourn Twp	Younger	+9%	- strong agriculture - poor plan	57% 43% 8%	0% (rural resident)	7.7%	$1174	$425	$4405	$947	X
Nepean	Younger	+10%	- urban development south - rural estate	86% 14% .4%	0% (rural resident)	25.6%	$1321	$682	$8125	$1431	X

Footnotes:

X = confidential

1 Relative to provincial average.
2 Population growth in 1976 to 1981 period.
3 Farm population as percent of total township population, 1981.
4 Number of cottagers as percent of total township population, 1981.
5 From 1981 Financial Statements.
6 From 1981 Census of Agriculture.

YELLOW

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Kingston Twp	Younger	+13%	- pro residential development	73% 27% 1%	0% (rural resident)	36%	$2157	$193	$2142	$856	X
Loughborough Twp	Same	+7%	- resettle from Kingston - cottage & lake concerns - agriculture not strong	0% 100% 9%	15% (rural resident)	3.8%	$1246	$184	$3393	$520	$2051
Storrington Twp	Same	+8%	- strong agriculture aggregate & cottaging concerns	0% 100% 13%	30%	2.6%	$1487	$396	$2672	X	$885
S. Crosby Twp	Older	+.4%	- relate to Rideau cottaging - pro development	0% 100% 14%	70%	11.2%	$1966	$228	$1794	$185	$2979
Bastard Twp	Older	+3%	- strong agriculture in south - pro cottaging & resident development	0% 100% 23%	50%	8.1%	$1714	$232	$1793	$2806	$5815
Kitley Twp	Same	+8%	- strong agriculture - rural	0% 100% 23%	2%	11.8%	$1261	$153	$1693	$1174	$1469

YELLOW (cont'd)

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age^1	Growth^2	Development Orientation	Urban/ Rural/ Farm^3	% Cottagers^4	Commercial/ Industrial/ Business as % Taxable Assessment^5	Per Capita Assessment^5	Value Agricultural Sales/ ha^6	Farm Capital Value/ ha^6	Per Operator Forest Product Sales^6	Per Operator Maple Tap Sales^6
S. Elmsley	Same	+27%	- pro development commercial near Smiths Falls	0% 100% 7%	50%	9.5%	$1188	$283	$2248	$467	X
Montague Twp	Same	+.5%	- strong agriculture - rural estate	28% 72% 9%	5% (rural resident)	12.3%	$963	$198	$1813	$1647	X
Rideau Twp	Younger	+4%	- strong agriculture - strong rural estate	30% 70% 11%	0% (rural resident)	5.4%	$1253	$458	$4523	$849	$1158
Goulbourn Twp	Younger	+9%	- strong agriculture - poor plan	57% 43% 8%	0% (rural resident)	7.7%	$1174	$425	$4405	$947	X
Nepean	Younger	+10%	- urban development in south - rural estate	86% 14% .4%	0% (rural resident)	25.6%	$1321	$682	$8125	$1431	X

Footnotes:

X = confidential

1 Relative to provincial average.
2 Population growth in 1976 to 1981 period.
3 Farm population as percent of total township population, 1981.
4 Number of cottagers as percent of total township population, 1981.
5 From 1981 Financial Statements.
6 From 1981 Census of Agriculture.

BROWN

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assess-ment[5]	Value Agric-ultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Kingston Twp	Younger	+13%	- pro residential development	73% 27% 1%	0% (rural resident)	36%	$2157	$193	$2142	$856	X
Storrington Twp	Same	+8%	- strong agriculture aggregate & cottaging	0% 100% 13%	30%	2.6%	$1487	$396	$2672	X	$885
S. Crosby Twp	Older	+.4%	- relate to Rideau & cottage - pro development	0% 100% 14%	70%	11.2%	$1966	$228	$1794	$185	$2979
Bastard Twp	Older	+3%	- strong agriculture in south - pro cottage & resident development	0% 100% 23%	50%	8.1%	$1714	$232	$1793	$2806	$5815
Kitley Twp	Same	+8%	- strong agriculture - rural	0% 100% 23%	2%	11.8%	$1261	$153	$1693	$1174	$1469
S. Elmsley Twp	Same	+27%	- pro resident development - commercial near Smiths Falls	0% 100% 7%	50%	9.5%	$1188	$283	$2248	$467	X

BROWN (cont'd)

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Montague Twp	Same	+.5%	- strong agriculture - rural estate	28% 72% 9%	5% (rural resident)	12.3%	$963	$198	$1813	$1647	X
Rideau Twp	Younger	+4%	- strong agriculture - strong rural estate	30% 70% 11%	0% (rural resident)	5.4%	$1253	$458	$4523	$849	$1158
Goulbourn Twp	Younger	+9%	- strong agriculture - poor plan	57% 43% 8%	0% (rural resident)	7.7%	$1174	$425	$4405	$947	X
Nepean	Younger	10%	- urban development in south - rural estate	86% 14% .4%	0% (rural resident)	25.6%	$1321	$682	$8125	$1431	X

Footnotes:

X = confidential

1 Relative to provincial average.
2 Population growth in 1976 to 1981 period.
3 Farm population as percent of total township population, 1981.
4 Number of cottagers as percent of total township population, 1981.
5 From 1981 Financial Statements.
6 From 1981 Census of Agriculture.

PURPLE

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Kingston Twp	Younger	+13%	- pro residential development	73% 27% 1%	0% (rural resident)	36%	$2157	$193	$2142	$856	X
Loughborough Twp	Same	+7%	- resettle from Kingston - cottaging - agriculture not strong	0% 100% 9%	15% (rural resident)	3.8%	$1246	$184	$3393	$520	$2051
Storrington Twp	Same	+8%	- strong agriculture aggregate & cottaging	0% 100% 13%	30%	2.6%	$1487	$396	$2672	X	$885
Bedford Twp	Older	-5%	- low agriculture - cottaging	0% 100% 24%	280%	9.6%	$1283	$80	$951	$1499	$1257
N. Crosby Twp	Older	+8%	- orient Rideau - hobby farms - not strong agriculture	0% 100% 30%	96%	4.8%	$1971	$161	$1274	$1038	$3783
S. Crosby Twp	Older	+.4%	- orient Rideau - cottaging - pro development	0% 100% 14%	70%	11.2%	$1966	$228	$1794	$185	$2979

PURPLE (cont'd)

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Bastard Twp	Older	+13%	- strong agriculture (south) - pro cottaging & development	0% 100% 23%	50%	8.1%	$1714	$232	$1793	$2806	$5815
Kitley Twp	Same	+8%	- strong agriculture - rural	0% 100% 23%	2%	11.8%	$1261	$153	$1693	$1174	$1469
S. Elmsley Twp	Same	+27%	- pro development - commercial near Smiths Falls	0% 100% 7%	50%	9.5%	$1188	$283	$2248	$467	X
Montague Twp	Same	+.5%	- strong agriculture - rural estate	28% 72% 9%	5% (rural resident)	12.3%	$963	$198	$1813	$1647	X
Rideau Twp	Younger	+4%	- strong agriculture - strong rural estate	30% 70% 11%	0% (rural resident)	5.4%	$1253	$458	$4523	$849	$1158
Goulbourn Twp	Younger	+9%	- strong agriculture - poor plan	57% 43% 8%	0% (rural resident)	7.7%	$1174	$425	$4405	$947	X
Nepean	Younger	+10%	- urban development (south) - rural estate	86% 14% .4%	0% (rural resident)	25.6%	$1321	$682	$8125	$1431	X

Footnotes:

X = confidential

1 Relative to provincial average.

2 Population growth in 1976 to 1981 period.

3 Farm population as percent of total township population, 1981.

4 Number of cottagers as percent of total township population, 1981.

5 From 1981 Financial Statements.

6 From 1981 Census of Agriculture.

ORANGE

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Kingston Twp	Younger	+13%	- pro residential development	73% 27% 1%	0% (rural resident)	36%	$2157	$193	$2142	$856	X
Portland Twp	Younger	+1%	- strong agriculture - some cottaging	0% 100% 14%	5%	8.6%	$1175	$179	$1766	$1178	$855
Hinchinbrooke Twp	Older	-7%	- low agriculture - rural - Hwy 38 development	0% 100% 14%	37%	4.7%	$1270	$41	$831	$483	$700
Bedford Twp	Older	-5%	- low agriculture - cottaging	0% 100% 24%	280%	9.6%	$1283	$80	$951	$1499	$1257
N. Crosby Twp	Older	+8%	- orient to Rideau - hobby farms not strong agriculture	0% 100% 30%	96%	4.0%	$1971	$161	$1274	$1038	$3783
Bastard Twp	Older	+3%	- strong agriculture in south - pro cottage & resident development	0% 100% 23%	50%	8.1%	$1714	$232	$1793	$2806	$5815

ORANGE (cont'd)

Criteria	Ability to Handle Change			Compatibility with Community			Economic Base Change				
Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	% Cottagers[4]	Commercial/ Industrial/ Business as % Taxable Assessment[5]	Per Capita Assessment[5]	Value Agricultural Sales/ ha[6]	Farm Capital Value/ ha[6]	Per Operator Forest Product Sales[6]	Per Operator Maple Tap Sales[6]
Kitley Twp	Same	+8%	- strong agriculture - rural	0% 100% 23%	2%	11.8%	$1261	$153	$1693	$1174	$1469
S. Elmsley Twp	Same	+27%	- pro development - commercial near Smiths Falls	0% 100% 7%	50%	9.5%	$1188	$283	$2248	$467	X
Montague Twp	Same	+.5%	- strong agriculture - rural estate	28% 72% 9%	5% (rural resident)	12.3%	$963	$198	$1813	$1647	X
Rideau Twp	Younger	+4%	- strong agriculture - strong rural estate	30% 70% 11%	0% (rural resident)	5.4%	$1253	$458	$4523	$849	$1158
Goulbourn Twp	Younger	+9%	- strong agriculture - poor planning	57% 43% 8%	0% (rural resident)	7.7%	$1174	$425	$4405	$947	X
Nepean	Younger	+10%	- urban development south - rural estate	86% 14% .4%	0% (rural resident)	25.6%	$1321	$682	$8125	$1431	X

Footnotes:

X = confidential

1 Relative to provincial average.
2 Population growth in 1976 to 1981 period.
3 Farm population as percent of total township population, 1981.
4 Number of cottagers as percent of total township population, 1981.
5 From 1981 Financial Statements.
6 From 1981 Census of Agriculture.

Line Numbers

APPENDIX B7

SUMMARY OF OFFICIAL PLANS AND ZONING BY-LAWS

APPENDIX B7

SUMMARY OF OFFICIAL PLANS AND ZONING BY-LAWS

ROUTE	CITIES/TOWNSHIPS AFFECTED	OFFICIAL PLANS AFFECTED	CONFORMITY NON-CONFORMITY	ZONING BY-LAWS AFFECTED	CONFORMITY NON-CONFORMITY	COMMENTS
1. BLUE	(Reg. Munic. Ottawa/ Carleton)	Ottawa/Carleton	Adequate general provisions	No Comprehensive By-law	-	-
	1. Nepean	Nepean	Adequate general provisions	Nepean	Conformity (with provisions)	Provided EA approval is obtained
	2. Kanata	Kanata	Silent with respect to policies	Kanata	Adequate general provisions	
	3. West Carleton	West Carleton	Adequate subject to EA Act	West Carleton	Conformity (with provisions)	Provided EA approval is obtained
	4. Ramsay	North Lanark	Permitted if necessary and can be made compatible	Ramsay	Adequate general provisions	
	5. Lanark	North Lanark	Permitted if necessary and can be made compatible	Lanark	Adequate general provisions	
	6. Dalhousie	Lavant, Dalhousie & N. Sherbrooke	Permitted if necessary and can be made compatible	No comprehensive by-law	-	-
	7. North Sherbrooke	Lavant, Dalhousie & N. Sherbrooke	Permitted if necessary and can be made compatible	No comprehensive by-law	-	-
	8. Oso	Oso	Adequate general provisions	Oso	Adequate general provisions	
	9. Bedford	Bedford	Adequate general provisions	Bedford	Adequate general provisions	
	10. Hinchinbrooke	Hinchinbrooke	Adequate general provisions	No comprehensive by-law	-	-
	11. Portland	Portland	Permits use in all designations except extractive Industrial	Portland	Adequate general provisions	Contrary to OP policy on utility in extractive industrial use designation
	12. Kingston	Kingston	Permitted if necessary and and can be made compatible	Kingston	Adequate general provisions	
	13. Ernestown	Ernestown	Silent with respect to policy	Ernestown	Adequate general provisions	
	14. South Fredericksburgh	South Fredericksburgh	Silent with repsect to policy	South Fredericksburgh	Adequate general provisions	

SPECIFIC COMMENTS: Fourteen townships and the Regional Municipality of Ottawa Carleton would be affected. This represents 13 different Official Plans and 11 different Zoning By-laws. The Official Plans for Kanata, Ernestown and South Fredericksburgh are silent with respect to policy covering utilities but their respective Zoning By-laws make adequate provisions for them. There is one potential problem area, the Portland Official Plan where an area of existing extractive industrial use is crossed, contrary to OP policy.

ROUTE	CITIES/TOWNSHIPS AFFECTED	OFFICIAL PLANS AFFECTED	CONFORMITY NON-CONFORMITY	ZONING BY-LAWS AFFECTED	CONFORMITY NON-CONFORMITY	COMMENTS
2. RED	(Reg. Munic. Ottawa/ Carleton)	Ottawa/Carleton	Adequate general provisions	No comprehensive by-law	-	
	1. Nepean	Nepean	Adequate general provisions	Nepean	Conformity (with provisions)	Provided EA approval is obtained
	2. Kanata	Kanata	Silent with respect to policies	Kanata	Adequate general provisions	
	3. Goulbourn	Goulbourn	Permitted if necessary and can be made compatible	Goulbourn	Adequate general provisions	
	4. Beckwith	North Lanark	Permitted if necessary and can be made compatible	Beckwith	Adequate general provisions	
	5. Drummond	Tay Valley	Use permitted except in Hazard Lands Area	Drummond	Adequate general provisions	The crossing of the Blueberry Marsh conflicts with the OP in Drummond
	6. Bathurst	Tay Valley	Use permitted except in Hazard Lands Area	Bathurst	Conformity (with provisions)	Provided EA approval is obtained
	7. South Sherbrooke	Tay Valley	Use permitted except in Hazard Land Area	South Sherbrooke	Conformity (with provisions)	Provided EA approval is obtained
	8. Oso	Oso	Adequate general provisions	Oso	Adequate general provisions	
	9. Bedford	Bedford	Adequate general provisions	Bedford	Adequate general provisions	
	10. Hinchinbrooke	Hinchinbrooke	Adequate general provisions	No comprehensive by-law	-	-
	11. Portland	Portland	Permits use in all designations except extractive industrial	Portland	Adequate general provisions	Contrary to OP policy on utility in extractive industrial designation
	12. Kingston	Kingston	Permitted if necessary and can be made compatible	Kingston	Adequate general provisions	
	13. Ernestown	Ernestown	Silent with respect to policy	Ernestown	Adequate general provisions	
	14. South Fredericksburgh	South Fredericksburgh	Silent with respect to policy	South Fredericksburgh	Adequate general provisions	

SPECIFIC COMMENTS: Fourteen townships and the Regional Municipality of Ottawa Carleton would be affected. This represents 13 different Official Plans and 13 different Zoning By-laws. The Official Plans for Kanata, Ernestown and South Fredericksburgh are silent with respect to policy covering utilities but their respective Zoning By-laws make adequate provisions for them. There are two potential problem areas: a) Drummond Township in the Tay Valley official plan where an area of hazard land is crossed, contrary to OP policy, and b) the Portland Official Plan where an area of existing extractive industrial use is crossed, contrary to OP policy.

ROUTE	CITIES/TOWNSHIPS AFFECTED	OFFICIAL PLANS AFFECTED	CONFORMITY NON-CONFORMITY	ZONING BY-LAWS AFFECTED	CONFORMITY NON-CONFORMITY	COMMENTS
3. GREEN	(Reg. Munic. Ottawa/ Carleton)	Ottawa/Carleton	Adequate general provisions	No comprehensive by-law	-	
	1. Nepean	Nepean	Adequate general provisions	Nepean	Conformity (with provision)	Provided EA approval is obtained
	2. Kanata	Kanata	Silent with respect to policy	Kanata	Adequate general provisions	
	3. Goulbourn	Goulbourn	Permitted if necessary and can be made compatible	Goulbourn	Adequate general provisions	
	4. Rideau	Rideau	General policy permits use	Rideau	Conformity (with provisions)	Provided EA approval is obtained
	5. Montague	Central Rideau	Permits use in all desingations except pits and quarries	Montague	Adequate general provisions	
	6. North Elmsley	Lots 1-11 Cental Rideau, Lots 1-30 Tay Valley	Tay Valley permits use in all designations except hazard lands	North Elmsley	Conformity (with provisions)	Provided EA approval is obtained Crossing of the Tay Marsh contrary to OP policy on hazard lands
	7. North Burgess	Tay Valley	Use permitted except in hazard lands	North Burgess	Conformity (with provisions)	Provided EA approval is obtained
	8. North Crosby	North Leeds	Adequate general provisions	No comprehensive by-law	-	-
	9. Bedford	Bedford	Adequate general provisions	Bedford	Adequate general provisions	
	10. Hinchinbrooke	Hinchinbrooke	Adequate general provisions	No comprehensive by-law	-	
	11. Portland	Portland	Permits use in all designations except extractive industrial	Portland	Adequate general provisions	Contrary to OP policy on utility in extractive industrial designation
	12. Kingston	Kingston	Permitted if necessary and can be made compatible	Kingston	Adequate general provisions	

ROUTE	CITIES/TOWNSHIPS AFFECTED	OFFICIAL PLANS AFFECTED	CONFORMITY NON-CONFORMITY	ZONING BY-LAWS AFFECTED	CONFORMITY NON-CONFORMITY	COMMENTS
3. GREEN (cont'd)	13. Ernestown	Ernestown	Silent with respect to policy	Ernestown	Adequate general provisions	
	14. South Fredericksburgh	South Fredericksburgh	Silent with respect to policy	South Fredericksburgh	Adequate general provisions	
	SPECIFIC COMMENTS	Fourteeen townships and the Regional Municipality of Ottawa Carleton would be affected. This represents fourteen different Official Plans and twelve different Zoning By-laws. The Official Plans for Kanata, Ernestown and South Fredericksburgh are silent with respect to policy concerning utilities but their respective Zoning By-laws make adequate provisions for them. There are two potential problem areas: a) North Elmsley in the Central Rideau Official Plan where a pit in Lot 3, Concession 9 is crossed, contrary to the Official Plan policies, and b) the Portland Official Plan where an area of existing extractive industrial use is crossed, contrary to OP policy.				

ROUTE	CITIES/TOWNSHIPS AFFECTED	OFFICIAL PLANS AFFECTED	CONFORMITY NON-CONFORMITY	ZONING BY-LAWS AFFECTED	CONFORMITY NON-CONFORMITY	COMMENTS
4. YELLOW	(Reg. Munic. Ottawa/ Carleton)	Ottawa/Carleton	Adequate general provisions	No comprehensive by-law	-	
	1. Nepean	Nepean	Adequate general provisions	Nepean	Conformity (with provisions)	Provided that EA approval is obtained
	2. Kanata	Kanata	Silent with respect to policies	Kanata	Adequate general provisions	
	3. Goulbourn	Goulbourn	Permitted if necessary and can be made compatible	Goulbourn	Adequate general provisions	
	4. Rideau	Rideau	General policy permits use	Rideau	Conformity (with provisions)	Provided that EA approval is obtained
	5. Montague	Central Rideau	Permits use in all designations except pits and quarries	Montague	Adequate general provisions	
	6. South Elmsley	Central Rideau	Permits use in all designations except pits and quarries	South Elmsley	Conformity (with provisions)	Provided that EA approval is obtained
	7. Kitley	Central Rideau	Permits use in all designations except pits and quarries	Kitley	Conformity (with provisions)	Provided that EA approval is obtained
	8. Bastard	North Leeds	Adequate general provisions	No comprehensive by-law	-	
	9. South Crosby	North Leeds	Adequate general provisions	No comprehensive by-law	-	
	10. Storrington	Storrington	Adequate general provisions	Storrington	Adequate general provisions	
	11. Loughborough	Loughborough	Adequate general provisions	Loughborough	Adequate general provisions	
	12. Portland	Portland	Permits use in all designations except extractive industrial	Portland	Adequate general provisions	
	13. Kingston	Kingston	Permitted if necessary and can be made compatible	Kingston	Adequate general provisions	
	14. Ernestown	Ernestown	Silent with respect to policy	Ernestown	Adequate general provisions	
	15. South Fredericksburgh	South Fredericksburgh	Silent with respect to policy	South Fredericksburgh	Adequate general provisions	

ROUTE	CITIES/TOWNSHIPS AFFECTED	OFFICIAL PLANS AFFECTED	CONFORMITY NON-CONFORMITY	ZONING BY-LAWS AFFECTED	CONFORMITY NON-CONFORMITY	COMMENTS
4. YELLOW (cont'd)	16. Town of Smiths Falls	Smiths Falls	Adequate general provisions	Smiths Falls	Adequate general provisions	

SPECIFIC COMMENTS: The Regional Municipality of Ottawa/Carleton, fifteen townships and the town of Smiths Falls would be affected. This represents fourteen different Official Plans and thirteen different zoning by-laws. The Official Plans for Kanata, Ernestown and South Fredericksburgh are silent with respect to policy concerning utilities but their respective Zoning By-laws make adequate provisions for them.

ROUTE	CITIES/TOWNSHIPS AFFECTED	OFFICIAL PLANS AFFECTED	CONFORMITY NON-CONFORMITY	ZONING BY-LAWS AFFECTED	CONFORMITY NON-CONFORMITY	COMMENTS
5. ORANGE BROWN	(Reg. Munic. Ottawa/ Carleton)	Ottawa/Carleton	Adequate general provisions	No comprehensive by-law	-	
	1. Nepean	Nepean	Adequate general provisions	Nepean	Conformity (with provisions)	Provided that EA approval is obtained
	2. Kanata	Kanata	Silent with respect to policy	Kanata	Adequate general provisions	
	3. Goulbourn	Goulbourn	Permitted if necessary and can be made compatible	Goulbourn	Adequate general provisions	
	4. Rideau	Rideau	General policy permits use	Rideau	Conformity (with provisions)	Provided that EA approval is obtained
	5. Montague	Central Rideau	Permits use in all designations except pits and quarries	Montague	Adequate general provisions	
	6. South Elmsley	Central Rideau	Permits use in all designations except pits and quarries	South Elmsley	Conformity (with provisions)	Provided that EA approval is obtained
	7. Kitley	Central Rideau	Permits use in all designations except pits and quarries	Kitley	Conformity (with provisions)	Provided that EA approval is obtained
	8. Bastard	North Leeds	Adequate general provisions	No comprehensive by-law	-	
	9. South Crosby	North Leeds	Adequate general provisions	No comprehensive by-law	-	
	10. Storrington	Storrington	Adequate general provisions	Storrington	Adequate general provisions	
	11. Kingston	Kingston	Permitted if necessary and can be made compatible	Kingston	Adequate general provisions	
	12. North Crosby	North Leeds	Adequate general provisions	No comprehensive by-law	-	
	13. Bedford	Bedford	Adequate general provisions	Bedford	Adequate general provisions	
	14. Hinchinbrooke	Hinchinbrooke	Adequate general provisions	No comprehensive by-law	-	
	15. Portland	Portland	Permits use in all designations except extractive industrial	Portland	Adequate general provisions	Contrary to OP policy on utility in extractive industrial designation

ROUTE	CITIES/TOWNSHIPS AFFECTED	OFFICIAL PLANS AFFECTED	CONFORMITY NON-CONFORMITY	ZONING BY-LAWS AFFECTED	CONFORMITY NON-CONFORMITY	COMMENTS
5. ORANGE BROWN (cont'd)	16. Ernestown	Ernestown	Silent with respect to policy	Ernestown	Adequate general provisions	
	17. South Fredericksburgh	South Fredericksburgh	Silent with respect to policy	South Fredericksburgh	Adequate general provisions	
	18. Town of Smiths Falls	Smiths Falls	Adequate general provisions	Smiths Falls	Adequate general provisions	

SPECIFIC COMMENTS: The Regional Municipality of Ottawa/Carleton, seventeen townships and the town of Smiths Falls would be affected. This represents fifteen different Official Plans and fourteen different Zoning By-laws. The Official Plans for Kanata, Ernestown and South Fredericksburgh are silent with respect to policy concerning utilities but their respective Zoning By-laws make adequate provisions for them. There is one potential problem area, the Portland Official Plan where an area of existing extractive industrial use is crossed, contrary to OP policy.

APPENDIX C

Public Involvement

APPENDIX C1 - Advisory Group

C1.1 List of Members

Dr. Ronald Black
Kingston Field Naturalists
45 College Street
Kingston, Ontario
K7L 4L5

Mr. John Brus
North Leeds Planning Board
Newboro, Ontario
K0G 1P0

Mr. Teo Frans
Leeds County OFA
RR #1
Toledo, Ontario
K0E 1Y0

Mr. Bruce Guthrie
AMEU
Perth PUC
Gore Street
Perth, Ontario

Mr. Bill Hiscock
Ministry of Natural Resources
Eastern Region Office
Provincial Government Blds.
Concession Road
Kemptville, Ontario
K0G 1J0

Mr. Ron Holmes *5
Ministry of Tourism & Recreation
1055 Princess Street
#308
Kingston, Ontario
K7L 5T3

Mr. Clyde C. Kennedy
Ontario Archeological Society
30 Nanaimo Drive
Nepean, Ontario
K2H 6Y1

Mr. Nigel Brereton
Regional Municipality of
Ottawa - Carleton
222 Queen Street
Ottawa, Ontario

Mr. Cliff Craig, Planner
Rideau Conservation Authority
PO Box 599
Mill Street
Manotick, Ontario
K0A 2N0

Mr. Richard Fraser
Ottawa - Carleton OFA
President
RR #3
Stittsville, Ontario
K0A 3G0

Dr. Helen Henrickson
Little Cataraqui Environmental
Association
56 Sherwood Drive
Kingston, Ontario

Mr. Ron Holman
Central Rideau Planning Board
RR #4
Smiths Falls, Ontario

Mr. Mike Holy
Ministry of the Environment
133 Dalton Avenue
Kingston, Ontario
K7K 6C2

Ms. Wendy Laut
Hydro Consumers Association
RR #7
Perth, Ontario
K7H 3C7

Mr. Arne Henrickson
Rideau Trail Association
56 Sherwood Drive
Kingston, Ontario

Line
Numbers

Mr. Gerritt Leeflang [3]
Lanark County, OFA
RR #1
Perth, Ontario
K7H 3C3

Mr. Keith Leonard [1]
Frontenac County South
Hartington, Ontario
K0H 1V0

Mr. Glenn Lockwood
Ontario Historical Society
353 Stewart Street
Ottawa, Ontario

Mr. Keith Matthie [4]
Institute of Agrologists
9 Promenade Avenue
Ottawa, Ontario

Mr. Ed Murphy
AMEU
Ottawa Hydro
3025 Albion Road N.
Ottawa, Ontario

Mr. Herb Norry [2]
OMAF
10 Sunset Boulevard
Perth, Ontario
K7H 2Y2

Ms. Joyce Reddoch
Ottawa Field Naturalists
548 Rivershore Crescent
Gloucester, Ontario

Mr. John Sheil
North Lanark Planning Board
RR #2
Carleton Place, Ontario
K7C 3P2

Mr. Bert Shingler
Executive Director
Federation of Ontario Cottagers' Association Incorporated
110-215 Morrish Road
West Hill, Ontario
MIC IE9

Mrs. Carol Groenewegen
Frontenac County, OFA
RR #1
Sydenham, Ontario
K0H 2T0

Mrs. Barbara Sproule
Frontenac County North
Snow Road, Ontario

Mr. Bill Stephenson
Parks Canada
Cornwall, Ontario
K5H 5V4

Mr. Bob Strachan
Lanark County
43 Drummond Street East
Perth, Ontario
K7H 1G1

Mr. Dave Symons
National Capital Commission
161 Laurier Avenue West
Ottawa, Ontario
K1P 6J6

Footnotes

1. Replaced by Mr. Bill Bracken following Meeting #2.
2. Replaced by Mr. Tom MacPherson following Meeting #2.
3. Represented both the Tay Valley Planning Board and Lanark County OFA beginning with Meeting #3.
4. Replaced by Mr. Ted Huffman following Meeting #3.
5. Replaced by Ms. Kimberly Lafferty following Meeting #4.

Line
Numbers

APPENDIX C1.2

TERMS OF REFERENCE

ADVISORY GROUP

TABLE OF CONTENTS

1.0 BACKGROUND

2.0 ROLE OF THE ADVISORY GROUP

3.0 CRITERIA FOR MEMBERSHIP

4.0 ORGANIZATION OF THE ADVISORY GROUP

5.0 PROPOSED SCHEDULE OF MEETINGS

6.0 TENTATIVE MEETING AGENDAS

7.0 RENUMERATION

1.0 BACKGROUND

Ontario Hydro will be carrying out studies to locate routes for transmission lines during the next 12 months.

As part of a programme to involve the public in this study, two regional committees will be set up: one for the area east of Ottawa, and one for the area west of Ottawa.

This document outlines the terms of reference for these committees.

2.0 THE ROLE OF THE ADVISORY GROUP

Within Eastern Ontario there are different perspectives on the problems associated with locating transmission corridors. Ontario Hydro's planning team has the responsibility to consider these different perspectives when making decisions about the proposed route.

The advisory group will be one of the publics consulted during the route stage study. Recommendations made by the advisory group will therefore be considered along with the recommendations made by government agencies, private industry, and the general public.

THE PRIMARY ROLE OF THE ADVISORY GROUP IS TO ASSIST ONTARIO HYDRO IN LOCATING TRANSMISSION CORRIDORS BY PROVIDING A REGIONAL OVERVIEW OF THE ISSUES AND CONCERNS RELATED TO LOCATING TRANSMISSION LINES.

To carry out this role, members of the group will be responsible for:

- advising on the importance of criteria used to identify alternative corridors
- acting as a liaison between the project team and their parent organization
- reviewing and commenting on key decisions throughout the route stage study.

3.0 CRITERIA FOR MEMBERSHIP

- Advisory group members should be representatives of municipalities, provincial or federal agencies, regional interest groups, or the private sector who have an interest in the study area.
- Advisory group members should be available to attend a total of five meetings within the next 12 months. The major working meeting(s) will be held during November and December of this year, while a possible three additional review meetings will be held next year.
- If an individual who does not represent an organization expresses an interest in being on the advisory group, then that individual should forward a letter to the community relations officer. The individual will be invited to attend meetings as an observer and may become an official member if the committee accepts him or her.

4.0 ORGANIZATION OF THE ADVISORY GROUP

Initially the group will be formed by Ontario Hydro Community Relations staff. The first meeting will be organized by Ontario Hydro.

After the intial meeting, dates and locations of meetings, meeting agendas, and meeting procedures will be worked out jointly by the group and Ontario Hydro staff.

Ontario Hydro will provide a person to record meeting notes.

5.0 PROPOSED SCHEDULE OF MEETINGS

1)	Orientation - Study Process Distribute List of Location Criteria	–	Nov 1982
2)	Rating of Corridor Location Criteria	–	Dec 1982
3)	Review Alternative Corridors	–	Winter 1983
4)	Review Alternative Routes	–	Spring 1983
5)	Review Recommended Route	–	Summer 1983

6.0 TENTATIVE MEETING AGENDAS

Meeting 1: Orientation

Purpose of Meeting:

- group members meet each other and meet the Ontario Hydro team
- group members become familiar with the overall study process and the study area
- group members understand, in some detail, how corridors will be located
- group members prepare to discuss criteria for locating corridors with their parent organizations
- distribute criteria form for external completion

Meeting 2: Rating of Location Criteria

- group members return completed criteria forms
- Ontario Hydro presents potential effects criteria and rating
- develop joint advisory group – Ontario Hydro ranking
- finalize ranking through general discussion

Meeting 3: Review of Alternative Corridors

Purpose of Meeting:

- to present the environmental constraint maps

- to outline the rationale for locating each of the alternate corridors
- to provide an opportunity to comment on site specific concerns within the alternative corridors
- to provide an opportunity to comment on alternative corridors
- to provide an opportunity to suggest any additional alternatives prior to evaluation
- to present information on each of the alternative corridors at a scale of 1:50,000

Meeting 4: Review Alternative Routes

Purpose of Meeting:

- to present detailed information on each alternative route as a basis for comment
- to provide an opportunity for the committee to state a preference for a particular alternative route
- to provide an opportunity to comment on site specific concerns within the alternative routes

Meeting 5: Review Preferred Route

Purpose of Meeting:

- to present detailed information on the preferred route as a basis for comment
- to provide an opportunity to suggest small scale changes in the route location
- to obtain the position of the committee regarding the preferred route

7.0 REMUNERATION

- Advisory group members will be reimbursed for all out of pocket expenses for accommodation, food, and travel at the following rates:

accommodation	- at cost
food	- at cost
travel	- 23¢/km

- Ontario Hydro has a policy of not reimbursing group members for time spent on advisory group work.

C1.3 Summary of Meetings

Meeting #1 - Saturday, November 20, 1982

Purpose:

To agree on a terms of reference for the advisory group and provide background information about the study that would assist members when rating the importance of local resources.

Results:

The Terms of Reference were accepted by the advisory group. After much discussion, there was agreement that the process to obtain their views was appropriate. By the conclusion of the meeting, members felt they had sufficient information to do a preliminary rating of local resources.

Meeting #2 - Saturday, December 11, 1982

Purpose:

To rate the importance of local resources (environmental objectives); to present Ontario Hydro's rating of possible effects a transmission line would have on the resources; and to agree on how to group the objectives into constraint levels.

Results:

An overall rating of objectives was achieved combining the advisory group's rating of importance with Ontario Hydro's rating of possible effects. Although members requested additional discussion of how Ontario Hydro rated the possible effects, they elected to have preliminary corridors developed based on the rating.

Meeting #3 - Saturday, March 12, 1983

Purpose:

To present the alternative corridors and review the role of the advisory group.

Results:

There was general agreement that the alternative corridors were properly located. Most of the discussion related to obtaining more detail about the corridors. The group also felt that the original Terms of Reference should still apply but an additional meeting should be held following the first series of municipal participation centres so that members could be briefed on public response to the corridors.

Meeting #4 - Saturday, June 25, 1983

Purpose:

To review the results of the first series of municipal participation centres.

Results:

The exchange of information between Ontario Hydro staff, advisory group members, and public observers increased everyone's understanding of what the issues and concerns of potentially affected communities are.

Meeting #5 - Saturday, October 29, 1983

Purpose:

To present the alternative routes and provide an update of the East Section deferment.

Results:

Discussion of the alternative routes centred on possible problems in certain areas and questions as to the reasoning for locating routes in certain areas. One new alignment in the north part of the Richmond Bog was suggested for further study.

Meeting #6 - Saturday, June 9, 1984

Purpose:

To present the results of the third series of municipal participation centres and the reasons for selecting the recommended route.

Results:

Discussion of the recommended route centred on relative differences between the alternative routes and if a ranked ordering of the routes was possible. Nine areas of special mitigation along the recommended route were outlined.

Line
Numbers

APPENDIX C2

MUNICIPAL PARTICIPATION CENTRES

C2.1 LIST AND SCHEDULE OF MUNICIPAL PARTICIPATION CENTRES AT ALTERNATIVE CORRIDOR STEP

C2.2 LIST AND SCHEDULE OF MUNICIPAL PARTICIPATION CENTRES AT ALTERNATIVE ROUTE STEP

C2.3 LIST AND SCHEDULE OF MUNICIPAL PARTICIPATION CENTRES AT RECOMMENDED ROUTE STEP

C2.4 COMMENT FORMS

C2.1 List and Schedule of Municipal Participation Centres at Alternative Corridor Step

March 21	Lanark Township	Community Centre, Middleville
March 22	Drummond Township	Municipal Office, Drummond Centre
March 23	Bathurst Township	Municipal Office, Glen Tay Road
March 24	Lavant/North Sherbrooke/Dalhousie Township	Municipal Office, McDonalds Corners
March 28	Portland Township	Municipal Office, Hartington
March 29	Loughborough Township	Municipal Office, Sydenham
March 30	Kingston Township	Municipal Office, Hwy. #38
April 5	Ramsay Township	Municipal Office, RR #2 Almonte
April 6	West Carleton Township	Municipal Office, Carp Road Carp
April 7	Goulbourn Township	Municipal Office, Stanley Corners
April 12	Hinchinbrooke and Bedford Township	Bedford Municipal Office County Road #8
April 13	South Sherbrooke Township	Municipal Office, Maberly
April 14	Oso Township	Oso Community Hall, Sharbot Lake
April 18	Beckwith and Montague Townships	Centennial Hall, Franktown
April 19	City of Nepean	City Hall, 3825 Richmond Road
April 20	City of Kanata	Kanata Town Centre, 150 Katimavik Road (3rd Floor)
April 21	Rideau Township	Township Hall, Roger Stevens Road North Gower
April 25	South Elmsley and Kitley Townships	Municipal Office, Toledo
April 26	Storrington Township	Storrington Lion's Hall, Sunbury

April 27	South Crosby Township	Morton Community Hall, Morton
April 28	Bastard/South Burgess Township	Portland Community Hall, Portland
May 3	North Crosby Township	Rideau Vista School, Highway #42
May 4	North Elmsley Township	Municipal Office, Port Elmsley (Station Road)
May 5	North Burgess Township	Municipal Office, Stanleyville
May 17	Montague Township	Community Centre, Rosedale

Hours - 7:00 pm to 10:00 pm

Line
Numbers

C2.2 List and Schedule of Municipal Participation Centres at Alternative Route Step

Open to the public 3:00-5:00 p.m. and 7:00-9:00 p.m.

Kingston Township -
Nov 7
Municipal Office
Hwy #38

Montague Township -
Nov 7
Centennial Hall
Rosedale

Portland Township -
Nov 8
Municipal Office
Hartington

Drummond Township -
Nov 8
Municipal Office
Drummond Centre

Bathurst Township -
Nov 9
Glen Tay Public School
Glen Tay Road

Loughborough
Township - Nov 9
Municipal Office
Sydenham

Lanark Township -
Nov 10
Township Hall
Middleville

Storrington Township -
Nov 10
Municipal Office
(Storrington Centre)
Battersea

Ramsay Township -
Nov 15
Clayton Community Hall
Clayton

West Carleton
Township - Nov 15
Municipal Office
Carp Road, Carp

Kanata and Nepean -
Nov 17
Nepean Sportsplex
Conference Room D

Goulbourn & Rideau
Townships - Nov 17
Goulbourn Municipal
Office
Stanleys Corners

Lavant/N. Sherbrooke/
Dalhousie Township -
Nov 21
Municipal Office
McDonalds Corners

Beckwith Township -
Nov 21
Old Firehall
Black's Corners

North Burgess
Township - Nov 22
Blessed Virgin Mary
Community Hall
Stanleyville

Kitly & South Elmsley
Townships - Nov 22
Lombardy Agricultural
Society
Community Hall,
Lombardy

North Crosby
Township - Nov 23
Rideau Vista Public
School
Hwy #42 (Westport)

South Crosby
Township - Nov 23
Morton Community Hall
Morton

North Elmsley
Township - Nov 24
Municipal Office
Port Elmsley

Bastard/South
Burgess Townships -
Nov 24
Portland Community
Hall
Portland

South Sherbrooke
Township - Nov 28
Municipal Office
Maberly

Oso Township -
Nov 28
Oso Community Hall
Sharbot Lake

Bedford &
Hinchinbrooke
Townships - Nov 29
Municipal Office
Godfrey

Toronto - Nov 30
Ontario Hydro
Mezzanine Auditorium
700 University Avenue

C2.3 List and Schedule of Municipal Participation Centres at Recommended Route Step

Open to the Public 3:00-5:00 p.m. and 7:00-9:00 p.m.

May 22	South Crosby	Morton Community Hall, Morton
	Ottawa	Hunt Club - Riverside, Community Centre 3320 Paul Anka Drive
May 23	Loughborough	Municipal Office, Sydenham
	Nepean/Kanata	Nepean Sportsplex, Hall A
May 24	Bastard/S. Burgess	Community Hall, Portland
	Goulbourn/Rideau	Goulbourn Municipal Office, Stanleys Corners
May 28	Kingston	Municipal Office, Kingston (Highway 38)
	Montague	Centennial Hall, Rosedale
May 29	S. Fredericksburgh/Ernestown	St. Johns Memorial Hall, Rosedale
	Beckwith	Old Firehall, Blacks Corners
May 30	Storrington	Municipal Office, Sunbury
	S. Sherbrooke/Bathurst	Glen Tay Public School, Glen Tay Road
May 31	S. Elmsley/Kitley	Lombardy Agricultural Society Community Hall, Lombardy
	Drummond	Drummond Centre
June 4	Portland	Municipal Office, Hartington
	North Crosby	Rideau Vista Public School, Westport (Highway 42)
June 5	Smiths Falls	Mariner's Inn, Smiths Falls
	North Burgess	Blessed Virgin Mary Community Hall, Stanleyville

June 6	Oso	Oso Communiy Hall, Sharbot Lake
	North Elmsley	Municipal Office, Port Elmsley
June 7	Ramsay	Clayton Community Hall Clayton
	Bedford/Hinchinbrooke	Bedford Municipal Office, Godfrey
June 11	N. Sherbrooke/Dalhousie/ Lanard	Lanark Township Hall, Middleville
	West Carleton	Municipal Office, Carp

APPENDIX C2.4

COMMENT FORMS

SPRING 1983

EASTERN ONTARIO STUDY
COMMENT FORM

Ontario Hydro is in the process of locating a route for new transmission lines in Eastern Ontario. Alternative corridors, much wider than the actual route required, have now been located. This comment form is intended to record your concerns about the corridors and your views about what we should consider when locating a transmission line.

A. Alternative Corridors

1. Is your property affected by one of the corridors?

YES ________ NO ________ CLOSE BY ________

a) If yes or close by, then which corridor? ________________

Please list any information about this corridor that we should know about.

2. What other information should we consider when locating a route?

B. When locating a transmission line, Ontario Hydro should:

	Agree	Uncertain	Disagree
• Follow property or concession lines			
• Keep costs down by avoiding turns in the line and taking the most direct route			
• Avoid significant environmental areas			
• Follow existing Hydro rights-of-way			
• Other (specify)			

C. Other Comments

Name ________________
Address ________________
Lot, Concession ________________
Occupation ________________
Phone ________________

Community Relations
Ontario Hydro
H6 E4
700 University Avenue
Toronto, Ontario
M5G 1X6

NOVEMBER 1983

EASTERN ONTARIO STUDY
COMMENT FORM

Ontario Hydro plans to locate a route for new transmission lines in eastern Ontario. Several route alternatives have now been identified. Your answers to the following questions will provide us with some of the information necessary to choose a preferred alternative.

- PLEASE PRINT -

1. Do you own property that is crossed by an alternative route? NO ______ YES ______

If yes, then

i) What is the identification colour of the route? (See map at MPC)

☐ Orange
☐ Purple
☐ Blue
☐ Brown
☐ Yellow
☐ Green
☐ Black
☐ Red

or what are the identification letters of the route (see Bulletin) ______ to ______

ii) Where is your property?

Lot ______________________________
Concession ______________________________
Township ______________________________
City ______________________________

iii) What is the specific land use on your property where the alternative route crosses?

Cultivated field ☐
Pastureland ☐
Woodlot ☐
Sugar Bush ☐
Cottage ☐
Home ☐
Commercial Industrial ☐
Other (Please be specific) ______________________________

iv) a) What physical change would occur to your property if crossed by a transmission line? PLEASE BE SPECIFIC

____
____
____
____
____

b) How would your use of the land be affected if crossed by a transmission line?

____
____
____
____
____

2. Many factors must be considered in comparing route alternatives and choosing a preferred route alternative. Keeping in mind the features of eastern Ontario and information available to you, what advantages disadvantages do you see with any of the alternatives? (Please indicate the alternative)

____
____
____
____
____
____
____

Name: ______________________________
Mailing Address: ______________________________
____
____
____

Telephone: ______________________________

Community Relations
Eastern Ontario Study
Ontario Hydro
700 University Avenue
Room H8-E4
Toronto, Ontario
M5G 1X6

Please keep the bottom copy. Deposit the top copy in the box provided, or mail to the address above.

NOVEMBER 1983

EASTERN ONTARIO – TELECOMMUNICATIONS STUDY
COMMENT FORM

Ontario Hydro plans to locate up to five microwave radio towers in Eastern Ontario. These towers will be used in monitoring and controlling power flow along the new transmission lines now under study.

POSSIBLE SITES have now been identified. Your answers to the following questions will help us choose the most appropriate sites.

–PLEASE PRINT–

(1) Do you own or rent property that is being considered as a possible site for a microwave radio tower?

YES ____

- If yes, then:
  - i) Which site? ____________
    (See map on display)
  - ii) Is there any information about your property that Hydro should know in considering it for a possible tower site?

CLOSE BY ____

- If close by, then:
  - i) To which site? ____________
    (See map on display)
  - ii) How close are you to the site?
    Within 1.0 km ____________
    1.0 km – 2.0 km ____________
    More than 2.0 km ____________
  - iii) What information about your area should Hydro know in considering possible sites?

(2) Do you have any other comments about this study?

Name: ____________
Address: ____________
____
Postal Code ____________
Lot ____ Concession ____________
Township: ____________
Telephone: ____________

Brenda Forbes
Ontario Hydro
Eastern Ontario Study
Route and Site Selection Division
Community Relations, Room H8-D6
700 University Avenue
Toronto, Ontario M5G 1X6

Please keep the bottom copy. Deposit the top copy in the box provided at the Participation Centre, or mail to the above address.
Thank You.

SPRING, 1984

EASTERN ONTARIO STUDY – WEST SECTION
COMMENT FORM

A recommended route for two 500 kV transmission lines has now been identified by Ontario Hydro. This follows an evaluation of the alternative routes presented in the fall of 1983, and other alternatives suggested by the public.

The authority for approval of the actual route location rests with the Joint Board, under the Consolidated Hearings Act. This Board may approve either the recommended or any alternative location within the route stage study area.

PLEASE PRINT

1a. Do you own property crossed by:

☐ recommended route ☐ alternative route

or

1b. Are you close to property, crossed by

☐ recommended route ☐ alternative route

Township: ______________________ Concession: __________ Lot: ______

2 If the recommended route or one of the alternative routes crosses your property, what would you like Ontario Hydro to consider when finalizing the actual right-of-way limits?

____

____

____

____

____

3. If you have any comments on the recommended route, or any of the alternatives, please let us know in the space below.

____

____

____

____

____

4. Please check (✓) the type of information you would find helpful. This information will be sent to you following this series of participation centres.

☐ Property and Compensation Policies

☐ Agriculture & Transmission Lines

☐ Construction & Forestry Practices

☐ Power line facts

☐ Maintenance of Rights-of-Way

☐ Approvals Process

5. If you have any comments or suggestions about how this study was done, please let us know in the space below.

____

____

____

____

____

Thank you for your participation.

Name: ______________________

Mailing Address: ______________________

____

____

____

Telephone: ______________________

Community Relations
Eastern Ontario Study
Ontario Hydro
Room H8-E4
700 University Avenue
Toronto, Ontario
M5G 1X6

Please keep the bottom copy. Deposit the top copy in the box provided, or mail to the address above.

MAY/JUNE, 1984

EASTERN ONTARIO – TELECOMMUNICATIONS STUDY
COMMENT FORM

Ontario Hydro plans to locate four microwave radio towers in Eastern Ontario. These towers will be used to monitor and control power flow along the new transmission lines now under study. They will also serve to protect the transmission equipment.

RECOMMENDED SITES have now been identified. We would appreciate your comments.

PLEASE PRINT

(1) Do you own or rent property close to one of the sites recommended for a microwave radio tower?

YES __________ NO __________

- If yes, then:
  - i) which site? ____________________
    (see map on display)
  - ii) How close are you to the site?
    within 1.0 km __________
    1.0 km - 2.0 km __________
    more than 2.0 km __________

(2) Do you have any comments about the site?

(3) Do you have any other comments about the study?

Name: ______________________________

Address: ______________________________

____

Postal Code: ______________________________

Lot: __________ Concession: ______________

Township: ______________________________

Telephone: ______________________________

Brenda Forbes
Ontario Hydro
Eastern Ontario Study
Route & Site Selection Division
Community Relations, Room H8D6
700 University Avenue
Toronto, Ontario
M5G 1X6

Please keep the bottom copy. Deposit the top copy in the box provided at the Participation Centre, or mail to the above address.

Thank You.

Line Numbers

C3

Municipal Resolutions

C3 Municipal Resolutions

Summary

Municipality	Date Received
1. Township of Portland	December 21, 1982
2. Township of South Crosby	February 7, 1983
3. Township of North Burgess (by-law)	April 4, 1983
4. Township of Bastard and South Burgess	April 27, 1983
5. Township of Lanark	May 3, 1983
6. Townships of Lavant, Dalhousie and North Sherbrooke	May 30, 1983
7. Township of North Crosby	June 1, 1983
8. Township of Ramsay	June 1, 1983
9. Township of North Elmsley	June 7, 1983
10. Township of Drummond (by-law)	August 2, 1983 (rescinded June 7, 1984)
11. Township of Bedford	August 4, 1983
12. Township of Hinchinbrooke	August 26, 1983
13. Township of Storrington	June 6, 1984

Portland Township

Motion carried December 21, 1982:

"Be it resolved that the Council request that Ontario Hydro stay away from all agricultural land in Portland Township when constructing the proposed Ontario Hydro corridor."

Motion carried February 15, 1983:

"Be it resolved that the Township of Portland write Premier Davis, our MPP, and the Minister of Agriculture concerning the Ontario Hydro line outlining the reasons for the ones including our concerns."

South Crosby Township

Motion carried February 7, 1983:

"To pass a Resolution that the Council of the Corporation of the Township of South Crosby strongly oppose the establishment of Ontario Hydro Corridor from Lennox Switch Station to Ottawa passing through our township, including Chaffey's Lock and Jones Falls."

North Burgess Township

Motion carried April 4, 1983:

"That the council of the Township of North Burgess oppose the placement of a hydro corridor through the municipality. A copy of this resolution along with the reasons for this opposition be forwarded to Ontario Hydro and to D. Wiseman, MPP."

Bastard and South Burgess Townships

Motion carried April 27, 1983:

"That the Township of Bastard and South Burgess object to the proposal hydro lines that may go through our Municipality."

Lanark Township

Motion carried May 3, 1983:

"That Council support the Union Hall Action Committee in opposing the proposed Ontario Hydro corridor through Lanark Township, and a letter to this effect be sent to Ontario Hydro."

Lavant, Dalhousie and North Sherbrooke Townships

Motion carried May 30, 1983:

"RESOLVED that the Council of the Township of Lavant, Dalhousie and North Sherbrooke support the petition in opposition to the proposed hydro corridor through the Municipality."

Line Numbers

North Crosby Township

Motion carried June 1, 1983:

"The Council of the Township of North Crosby strongly object to the proposed 500 kV Ontario Hydro tower line being built through our Township."

Ramsay Township

Motion carried June 1, 1983:

"That Council supports the UHAC and its endeavours to get answers from Ontario Hydro in order for the committee to fully present its case, based on health, safety, environmental, property values and compensation factors."

Motion carried June 1983:

"That Ramsay Township Council wishes to express its concerns to Ontario Hydro over the proposed EHV power lines through Ramsay Township and further request Ontario Hydro to endeavour to answer as quickly as possible the concerns of the affected Ramsay Township property owners."

North Elmsley Township

Motion carried June 7, 1983:

Be it resolved:
"That the Council of the Township of North Elmsley oppose the placement of a Ontario Hydro Transmission Line Corridor through the municipality. A copy of this resolution along with the reasons for this opposition be forwarded to Ontario Hydro and to Hon. D. Wiseman, MPP."

Drummond Township

Motion carried August 2, 1983:

A by-law to Prohibit High Voltage Transmission Lines in the Township of Drummond.

"WHEREAS it is deemed necessary to protect the interests of both permanent and seasonal residents of the Township of Drummond, their property, farms and livestock, the natural environment as well as the tourist attraction of the area and

WHEREAS it is felt that a high voltage transmission tower line would infringe upon these interests

THEREFORE the Council of the Corporation of the Township of Drummond enacts as follows:

1. That upon the passing of this by-law high voltage transmission tower lines are prohibited within the Township of Drummond."

Line Numbers

Bedford Township

Motion carried August 4, 1983:

"BE IT HEREBY RESOLVED that the Council of the Township of Bedford communicate to Ontario Hydro and to the Minister of Energy its opposition to the proposed 500 kilovolt transmission line through the township on the grounds that:

1. such lines will mar the natural beauty of an area where tourism is the most important industry;

2. many property owners will suffer a serious drop in the market value of their property as a result of proximity to the proposed lines;

3. many township residents are concerned about possible hazardous effects of the lines themselves and of the herbicides sprayed on the corridor;

4. to many residents of Bedford it seems preferable to develop alternative methods to solve Ottawa's possible supply shortfall."

Hinchinbrooke Township

Motion carried August 26, 1983:

"That Ontario Hydro evaluate Mr. R. Gene's alternate hydro line proposal as an alternative to the proposed routes for the new double transmission line, Bath to Ottawa.

Storrington Township

Motion carried June 6, 1984.

"That we the Council of the Township of Storrington deem it necessary to protect the interests of both permanent and seasonal residents in the Township, their property, farms, livestock and the Natural Environment. To support the residents in the area of the preferred Ontario Hydro route that any high voltage transmission line would infringe upon these interests."

APPENDIX D

TELECOMMUNICATIONS

D1 DEVELOPMENT OF ALTERNATIVE PLANS AND STUDY AREAS

D2 RATIONALE FOR SELECTION OF PLAN II AND REFINEMENT OF STUDY AREAS

D3 DESCRIPTION OF STUDY AREAS IN PLAN II

D4 ENVIRONMENTAL SITUATIONS AND ASSIGNED CONSTRAINT LEVEL RATINGS

D5 RATIONALE FOR RATINGS OF ENVIRONMENTAL SITUATIONS

D6 ENVIRONMENTAL FACTOR AND COMPOSITE CONSTRAINT MAPS

D7 TECHNICAL CONSTRAINT MAPS

D8 SITE SELECTION DATA TYPES AND SOURCES

APPENDIX D1

DEVELOPMENT OF ALTERNATIVE PLANS AND STUDY AREAS

1.0 ALTERNATIVE PLANS

Two alternative plans were developed for consideration in the extension of Ontario Hydro's existing microwave radio system into Eastern Ontario. The rationale for developing these two options is described below.

For Plan I, the straight line distance between Hinchinbrooke SS and Hawthorne TS is approximately 123 km (77 miles). The maximum distance between adjacent microwave radio stations in the Ontario Hydro system is typically less than 48 km (30 miles). Given this, it was possible to consider a minimum of two microwave radio repeater stations between the two terminal points with a theoretical separation distance between stations of 42 km (26 miles). By minimizing the number of repeater stations, it was felt that construction and operating costs, in addition to the number of properties affected, could be kept to a minimum.

Plan II was developed on the basis that by establishing three repeater stations between the two terminal stations, the stations could be better placed in strategic geographical locations. This would result in lower tower heights and more reliable communications due to shorter transmission distances between stations.

2.0 STUDY AREAS

Study areas were established for each of the two alternative plans by applying two sets of criteria. The first set was technical in nature and produced general zones in which study areas could be established. The second set consisted of environmental and technical criteria which were applied within these general zones to arrive at study areas with well defined boundaries. The following provides an explanation of what these criteria were and how they were applied for each alternative plan.

Plan I resulted in the identification of two study areas -- one for each of the two repeater stations required. A straight line was drawn between the two terminal stations representing the theoretical radio signal path between these two points. Radii of 32 and 48 km (20 and 30 miles) were drawn from the Hinchinbrooke SS east and extended 30 degrees on both sides of the centre line. The same procedure was followed from the Hawthorne TS west. This produced two 16 km (10 miles) wide radial arcs with 30 degree spreads from the centreline as shown in Figure D1.

The location and size of the radial arcs were based on the maximum acceptable radio signal transmission distance of 48 km and the objective of establishing two repeater stations. The 30 degree angle from both sides of the centreline and the 16 km wide arcs were chosen to provide sufficient area for identifying technically and environmentally acceptable study areas.

Line Numbers

With the radial arcs established, a second set of criteria was defined and applied to assist in reducing the general zones down to study areas with well defined boundaries. These criteria were as follows:

- exclude urban and recreation areas where possible;
- exclude large wetland areas;
- exclude relatively large inaccessible areas;
- exclude large areas of relatively low elevation;
- exclude areas beyond 1/4 mile from a year-round access road;
- keep the number of municipalities potentially affected to a minimum if the area remaining is sufficient to identify a reasonable number of alternative sites;
- exclude areas outside the Route Stage study area.

Both the general zones and the resultant study areas for Plan I are shown in Figure D1.

Plan II resulted in the identification of three study areas - one for each repeater station required. The process of locating these areas centred around identifying areas of relatively high elevation evenly spaced apart.

Proceeding east from Hinchinbrooke SS the first general zone is located north of Westport. This zone is generally of high elevation and can provide good radio line-of-sight paths in both the east and west directions. The second zone runs from the Smiths Falls area north to Franktown. It contains areas of relatively high elevation. It also contains Smiths Falls TS which represents a potential site for a repeater station.

The third zone was identified between Carleton Place and Richmond. It represented an area between Smiths Falls and Ottawa with suitable elevations for a repeater station.

After having established the general zones for Plan II, the second set of environmental and technical criteria were used to produce study areas. Two study areas for the first repeater station were identified north of Westport - one in North Crosby and the other in South Sherbrooke Township.

The second zone gave rise to the Smiths Falls study area which includes portions of South Elmsley and Montague Townships. Since the third area fell within the same general area as in Plan I, it shared the same study area. Figure D1 illustrates the study areas for Plan II.

APPENDIX D2

RATIONALE FOR SELECTION OF PLAN II AND REFINEMENT OF STUDY AREAS

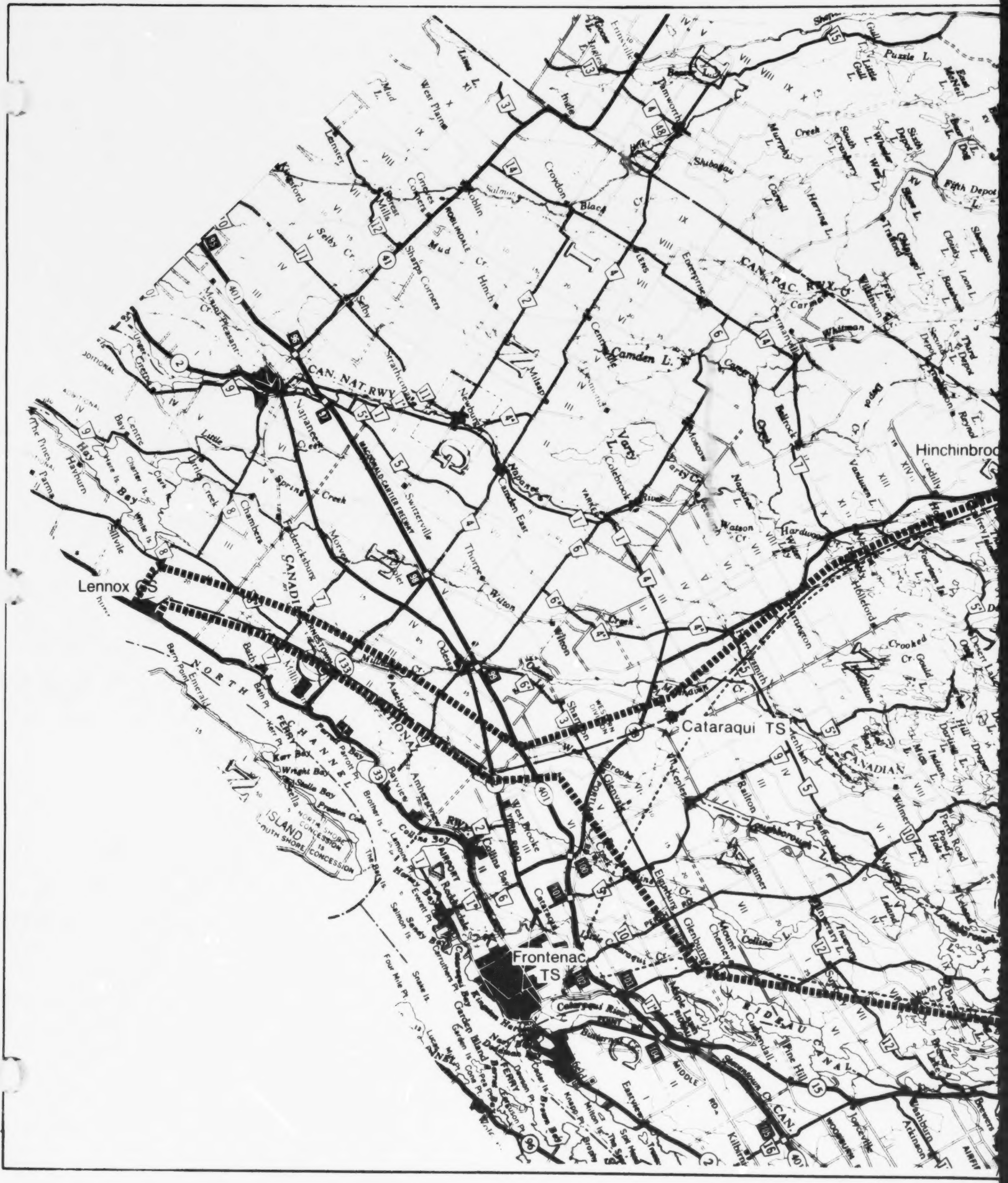
1.0 ELIMINATION OF PLAN I

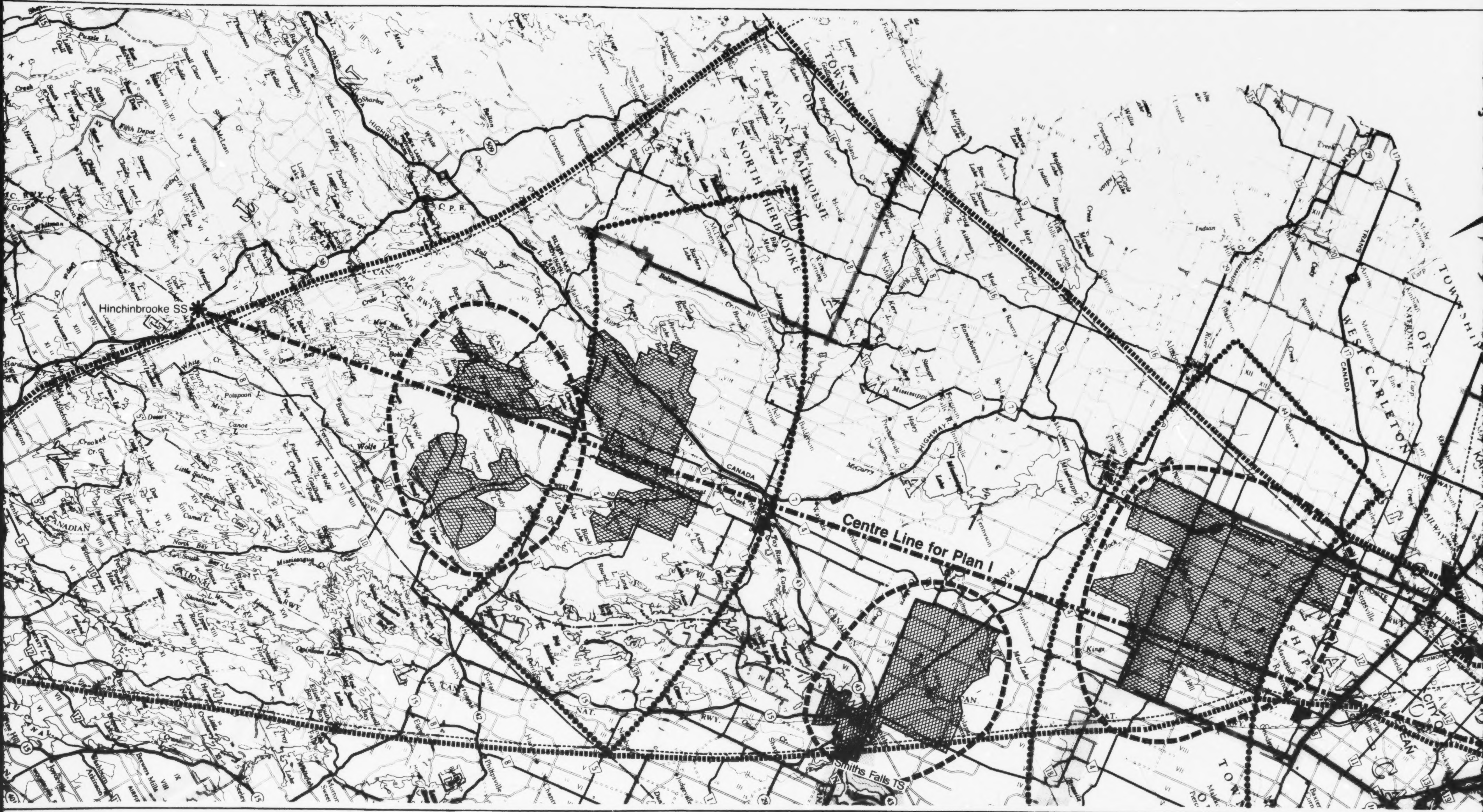
Elimination of Plan I was related to the technical, economic and environmental advantages of Plan II and its associated study areas. Plan II involves four hops (i.e., separation between stations) whereas Plan I involves three longer hops. Technically, the system involving the shorter hops is preferable since radio communication is more reliable. Economically, Plan II is less costly due primarily to the shorter tower heights required and the ability to use the existing tower at Hinchinbrooke SS. From an environmental perspective, a station site in the South Sherbrooke/Bathurst/North Burgess study area would have a greater visual effect than in the North Crosby/South Sherbrooke study area. This is largely due to greater population densities in the rural areas, including the viewsheds from Highway 7 and cottaging lakes (Pike, Black, Christie, Otty and Bennett). In terms of land use, however, there is sufficient area available for the identification of suitable sites.

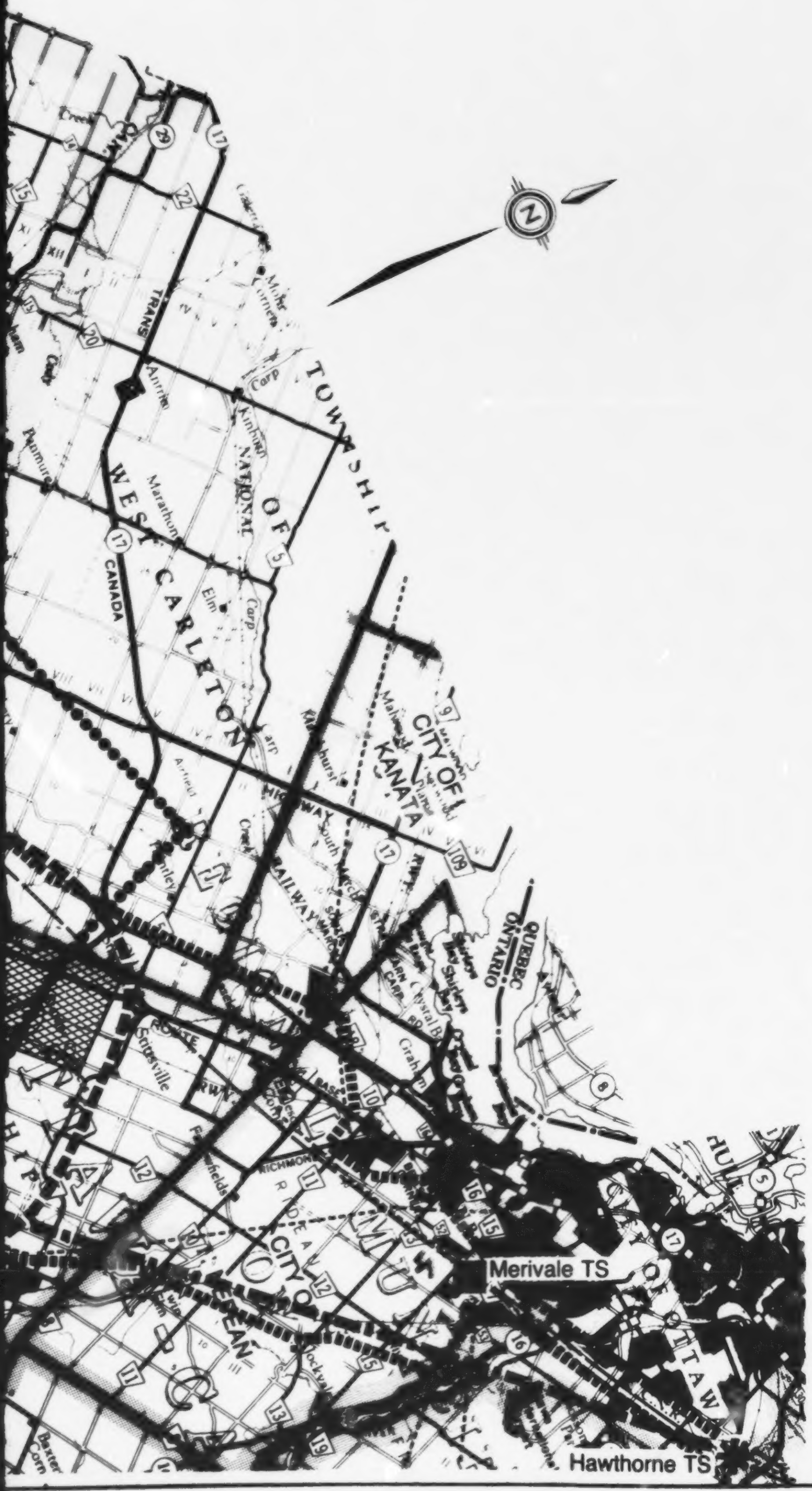
2.0 CHANGES TO THE MONTAGUE/SOUTH ELMSLEY STUDY AREA

The Montague/South Elmsley study area of Plan II was reduced to the existing transformer station site at Smiths Falls primarily for technical and economic reasons. Telephone circuits are currently leased from Bell Canada for the Data Acquisition Computer System (DACS) and administrative voice applications for Smiths Falls TS. A microwave radio station located at the TS would eliminate the leasing costs. In addition, the site is more secure since the TS is manned 24 hours a day. When the existing power line carrier (PLC) system at Smiths Falls TS becomes obsolete, the PLC channels can be readily accommodated by switching over to the microwave radio system. Incorporation of this station into the microwave radio system would significantly reduce the equipment replacement cost at a future date.

The site acquisition and development costs of locating a microwave station at Smiths Falls TS would be less than at any other location in the original Montague/South Elmsley study area. Environmentally, this site has the advantage of not requiring any additional land, being located in an industrial area and adjacent to two existing radio towers. This site, however, falls within the viewsheds of Smiths Falls and the Rideau Canal. The expected change in the landscape will not be great due to the level of development already present.


Lennox GS
Cataraqui TS
Frontenac TS
Hinchinbroo
CAN. NAT. RWY.
CAN. PAC. RWY.
Camden L.
Varty L.
Puzzle L.
NORTH CHANNEL
RIDEAU CANAL
Sharbot
Tamworth
Croydon
Enterprise
Newburgh
Camden East
Yarker
Harrowsmith
Sydenham
Odessa
Wilton
Bath
Parrott Bay
Amherstview
Collins Bay
Glenburnie
Selby
Moscow
Colebrook
Hartington
Inverary
Joyceville
Westbrooke
Elginburg
Cataraqui
Kingston
Strathcona
Napanee
Hay Bay
Centre
Parma
Kaladar


Hinchinbrooke SS
Centre Line for Plan I
Smiths Falls TS
LAVANT, DALHOUSIE & NORTH SHERBROOKE
TOWNSHIP OF
WEST CARLETON
CANADA
HIGHWAY
C.P.R.
Sharbot
Mississippi
Indian
Kings
NAT. RWY.


TOWNSHIP OF WEST CARLETON
CITY OF KANATA
CITY OF OTTAWA
TRANS CANADA HIGHWAY
QUEBEC
ONTARIO
HULL
Carp
Kinburn
Antrim
Marathon
Palmure
Merivale TS
Hawthorne TS

Appendix D1
Alternative Plans and Study Area Development

Legend

—— ——	Existing 230 kV Line
-------------	Existing 115 kV Line
■, TS, SS	Transformer or Switching Station
✱	Terminal Station
▪▪▪▪▪▪▪▪▪▪▪▪▪▪	Eastern Route Study Area Boundary
●●●●●●●●●●	General Area for Plan I
▬ ▬ ▬ ▬ ▬	General Area for Plan II
▨	Telecommunications Study Area

Scale 1:250,000

5 0 5 Miles

5 0 5 Kilometres

Eastern Ontario Study
- Telecommunications

APPENDIX D3

DESCRIPTION OF STUDY AREAS IN PLAN II

1.0 NORTH CROSBY/SOUTH SHERBROOKE STUDY AREA

The portion of the study area in South Sherbrooke Township contains small pockets of Class 3 agricultural land but Class 6 and 7 land predominates.

The forest cover is mainly mixed hardwoods and softwoods of intermediate value with valuable hardwoods located around Farren Lake. Forest productivity is high for the north half and low for the south half of the study area. Four Woodland Improvement Act Agreements and one Agreement Forest are present.

The soils are generally shallow, being sandy loam with bedrock close to or exposed on the surface. A number of localized sand and gravel deposits occur and a small active pit is located south of Christie Lake. The topography is moderately to steeply sloped.

A waterfowl breeding area exists along the Tay River, west of Christie Lake.

Two areas of archaeological potential have been identified in addition to three known archaeological sites all in the western portion of the study area.

Farms and residences are scattered along the road network which follows the inner edge of the study area. The main concentration of seasonal residences is found along the shores of Farren Lake which is situated in the centre of the study area. Immediately adjacent and partly within the viewshed of the study area are Bobs, Christie and Crosby Lakes which are also well developed cottaging lakes. A scout camp and a boys' camp are located on the west end of Christie Lake and lie within the study area.

The North Crosby Township portion of the study area primarily consists of Class 7 agricultural capability land with small pockets of Class 3 capability, used for grain production or forage to support a small number of beef and dairy operations.

The forest cover is predominantly mixed hardwoods and softwoods of intermediate value with an area of valuable hardwoods in the southeastern portion of the study area. A valuable softwood forest exists in the Foley Mountain Conservation Area just north of Westport.

The soils are shallow sandy loam with numerous rock outcrops and scattered pockets of muck soils. The topography ranges from flat to moderately sloped with lower land elevations found at the northern end of the study area.

From a biological resources perspective, a deer yard extends along the southern edge of the study area, a large wetland area is located in the southeast portion and an area containing significant floral species has been identified just north of Westport.

Farms and rural residences are few in number and scattered along the roads.

Line Numbers

The North Crosby study area has a much lower permanent and seasonal population density than the South Sherbrooke study area. From a visual standpoint, it is close to heavily used recreation lakes such as Crosby, Pike, Upper Rideau, Wolfe and Westport Sand and the village of Westport.

2.0 GOULBOURN/BECKWITH STUDY AREA

The study area between Carleton Place and Richmond includes portions of Beckwith and Goulbourn Townships.

Agriculture is a predominant land use with Class 2 capability lands being the best in the area. The fields are actively cultivated or in pasture. Small areas of abandoned agricultural lands are scattered throughout.

The forest cover consists of mixed hardwoods and softwoods of intermediate value in addition to conifer plantations scattered throughout the study area. The high productive forest land is evenly distributed and the low productive forest land is found mainly in the northern wet portions of the study area. Numerous Woodland Improvement Act Agreements are present.

The soils are sandy loam and range in stoniness from low to very high. Small sand and gravel deposits occur over the entire study area with a number of licensed pits and quarries located in the eastern half. The topography is flat to gently sloping with land elevations increasing to the north and south.

Sensitive wetlands are the Goodwood Marsh and two areas north and west of Ashton. A deer yard exists on the north side of Highway 7 midway between Carleton Place and Stittsville.

Numerous small areas of Paleolithic archaeological potential have been identified but no known archaeological sites have been recorded. An area of high Archaic archaeological potential is located northeast of Ashton Station.

The areas of human settlement concentration and of historic significance are Munster, Ashton, Prospect and Stapleton. These settlements are relatively small compared to those found adjacent to the study area such as Carleton Place, Almonte, Stittsville and Richmond.

The farms and rural residences are fairly evenly distributed. The road network is laid out in a grid pattern and is well developed throughout the study area with the exception of a few unopened road allowances.

From a recreation standpoint, there is a golf course on Highway 7 and another east of Dwyer Hill, a rifle range south of Highway 7, a speedway north of Stapledon, and a trout farm and a campground northeast of Dwyer Hill.

APPENDIX D4

ENVIRONMENTAL SITUATIONS AND ASSIGNED CONSTRAINT LEVEL RATINGS

(H - High, M - Medium, L - Low)

FACTOR	CATEGORY	SITUATION	RATING
Agricultural Resources	Tile Drainage	Location of Tile Drains	H
Appearance of The Landscape	Viewshed of Lakes	Viewsheds of Cottage Lakes	M
		Viewsheds of Other Lakes	L
	Viewsheds of Human Settlements	Primary Viewsheds of Urban and Rural Residential Concentrations	M
		Secondary Viewsheds of Urban and Rural Residential Concentrations	L
	Viewsheds of Scenic Interest Areas	Primary Viewsheds (Westport area)	H
	Special Viewsheds	Viewsheds of Provincial Highways of Special Interest Roads Through Natural Landscapes With Hills Greater Than 20 m High	M
		Viewsheds of Provincial Highways or Special Interest Roads Through Man Modified Landscapes	L
	Special Landscapes	Natural Landscapes With Hills Greater Than 20 m High Outside of Identified Viewsheds	L

FACTOR	CATEGORY	SITUATION	RATING
Biological Resources	Waterfowl Communities	High Value Waterfowl Habitat	H
		Low Value Waterfowl Habitat	L
	Terrestrial Communities	Rare/Unusual Flora	H
		Rare/Unusual Flora and Significant Representative Vegetation	H
	Wetlands	High Value Wetlands	H
		Medium Value Wetlands	M
		Low Value Wetlands	L
	Wildlife Communities	Deer Yard, Fauna and Heronry	H
		Rare/Unusual Fauna	H
		High Value Deer Yard	H
		Medium Value Deer Yard	M
		Low Value Deer Yard	L
	Biological Management Areas	Designated Environmental Protection Area and Mature Reserve	H
		Designated Environmental Protection Areas	H
		Fish Hatchery/Trout Farm	L
	Fish Communities	Spawning Areas	H
		Cold Water Lakes, Rivers, Streams (Resident/Migratory)	H
		Warm Water Lakes, Rivers, Streams	L

FACTOR	CATEGORY	SITUATION	RATING
Forest Resources	Forest Management Areas	W.I.A.	H
		Conservation Authority Forest	H
		Agreement Forest	H
	Productivity of Forest Land	High Productive Forest Land	M
		Low Productive Forest Land	L
	Forest Associations	Conifer Plantations	H
Heritage Resources	Known Archaeological Sites	Confirmed (Borden) Sites	H
		Reported But Unsubstantiated Sites	M
	Known Historic Sites	Settlements	H
		Rideau Canal	M
	Areas of High Paleolithic Archaeological Potential	Paleolithic Areas	M
	Areas of High Archaic Archaeological Potential	Archaic Areas	M
	Areas of High Initial Woodlands Archaeological Potential	Initial Woodlands Areas	M
Human Settlement	Existing Land Use	Non-urban Commercial Industrial/Institutional Concentrations	M
		Areas of Cottage Concentrations	H
		Rural Residential Concentrations	H

FACTOR	CATEGORY	SITUATION	RATING
Human Settlement (cont'd)	Existing Land Use (cont'd)	Sewage Lagoons, Waste Disposal Sites, Dumps, Auto Wrecking Yards	H
	Proposed Other Use	Approved Subdivisions	H
		Pending Subdivisions	
Mineral Resources	Possible Sand and Gravel Reserves	Possible Sand and Gravel Reserves	M
	Existing Mineral Industries	Active Licensed And Unlicensed Pit Sites	H
		Active Licensed and Unlicensed Quarry Sites	H
Recreation Resources	Existing Recreation	Tent or Trailer Park	H
		Rifle Range/Skeet Club	H
		Golf Courses	H
		Conservation Areas/RMOC Recreation - Conservation Areas	H
		Resorts, Commercial Cottages	H
		Private Parks and Campgrounds/Bible Camp/Scout Camp	H
		Fairgrounds	H
		Trout Farms/Fish Sanctuaries	H

APPENDIX D5

RATIONALE FOR RATINGS OF ENVIRONMENTAL SITUATIONS

AGRICULTURAL RESOURCES

Tile Drained Fields

- rated high because of the high capital expenditure and the improved productivity created

Monoculture/Corn

- rated high because these areas represent management input and generally high soil productivity

Specialty Agriculture

- rated high due to their small size and, therefore, a possibly higher overall negative effect on the operation
- specialty crop operations are limited in eastern Ontario
- these areas may contain specifically suited soils for this form of production

Mixed Agriculture

- rated medium due to the variability in soil capability
- these areas have a greater likelihood of containing a compatible site for a microwave tower (one with poorer quality soils)

Hay, Pasture and Grazing Areas

- rated low because of the prevalence of marginal or unsuitable agricultural soils on which effects would be low

APPEARANCE OF THE LANDSCAPE

Viewshed of Westport to Westport Mountain

- rated high because the mountain is a regionally significant feature
- it represents a high degree of contrast and is visible from very long distances

Viewsheds of Provincial Highways and Special Interest Roads Through Landscapes that are Natural and have Hills that are Greater than 20 Metres High

- rated medium because of the change to the appearance of the landscape that would occur

- a microwave tower, because of its size, can dominate the surrounding landscape in the immediate vicinity of the tower

- the highway and road viewsheds provide the opportunity for large numbers of people to view the microwave tower

- users of special interest roads may have specific expectations about the landscape through which the roads pass and a microwave tower may not comply with those expectations

Natural Landscapes having Hills Greater than
20 Metres High Outside Any Identified Viewshed

- rated low because these landscapes would undergo the same changes as the previous situation but because there is a much lower possibility that the changes would be seen low

Viewsheds of Provincial Highways or Special
Interest Roads Through Non-Modified Landscapes

- rated low because the landscape units are man-modified and a microwave tower would result in less changes to the character of the landscape

Rideau Canal Viewshed

- rated medium because a microwave tower is out of character with the historic theme of the waterway and large numbers of people use the canal

- it is recognized as a sensitive viewshed

Viewsheds of Cottaging Lakes

- rated medium because the changes to the appearance of the landscape may conflict with owners' expectations and possible high degree of contrast between the structural form of the towers and the water/shoreline landscape

Viewsheds of Non-Cottaging Lakes

- rated low because there are less viewers than in the viewsheds of cottaging lakes

Primary Viewsheds of Urban and Rural
Residential Concentrations

- rated medium because of the number of viewers and the visual "intrusion" that a microwave tower could represent if located in proximity to residential properties

Secondary Viewshed of Urban and Rural Concentrations

- rated low as compared to the medium rating for the primary viewsheds because of an increase in distance between the viewers and the tower site thus reducing the visual impact

BIOLOGICAL RESOURCES

Waterfowl Habitat

- broken down into high and low constraint areas based on an evaluation of productivity of habitat and level of disturbance

Terrestrial Communities

- areas containing rare, significant, unusual or representative forms of vegetation are rated high due to their recognition by government and naturalist groups and their sensitivity to physical alteration

Wetlands

- rated high, medium or low based on their relative degree of recognition by government and naturalist groups, their sensitivity to change and their level of disturbance

Wildlife Communities

- deer yards are rated high, medium and low based on the quality of the habitat for food and shelter and the level of importance placed on these areas by government

- rare and unusual faunal habitat are rated high due to their recognition by government and naturalist groups and their sensitivity to physical alteration

Biological Management Areas

- wildlife management areas, fish sanctuaries and designated natural and protection areas are rated high due to their official status as defined by government (mainly MNR)

- sport fisheries management lakes and fish hatcheries are rated low due to the low potential effect construction would have on the fisheries resource

FOREST RESOURCES

Forest Management Areas

- rated high because of the high combined investments of time, manpower and capital to increase productivity

- they constitute parts of MNR's policy areas

High Productive Forest Land (outside of forest management areas)

- rated medium due to lower capital investment for forest management purposes but still contribute to MNR's forestry objectives and targets

Low Productive Forest Land

- rated low because of its low productivity and little if no effort expended in forest management

HERITAGE RESOURCES

Known Historic Sites

- rated high because of their recognized historical and cultural significance

- tower development on these sites would detract greatly from the historical theme being portrayed

Known Archaeological Sites, Reported but Unsubstantiated Archaeological Sites, and Areas of High Archaeological Potential

- all archaeological sites are rated medium because the sites are generally defined on a lot and concession basis and although the resource is valuable and irreplaceable, the over estimate of site size could eliminate a suitable tower site unnecessarily

- areas of high archaeological potential are rated medium because the existence of artifacts and their location in these areas cannot be precisely determined

HUMAN SETTLEMENT

Areas of Cottage Concentrations

- rated high due to the physical incompatibility between this use and a microwave tower

- would detract from the natural recreation type views of the cottage users

Rural Residential Concentrations

- rated high due to incompatibility between this use and a microwave tower

- immediate views would be negatively affected

Urban Settlements

- rated high due to a relatively higher number of potential viewers

- also may represent an incompatible use if located in or adjacent to a residential area

- higher property costs

Waste Areas (i.e., sewage lagoons, waste disposal sites, dumps, auto wrecking yards)

- rated high because these sites may pose a hazard or result in technical problems if a tower is located on these properties

Non-Urban Commercial, Industrial, Institutional Concentrations

- rated medium since these areas are generally more compatible

- vacant and compatible portions may be present within these areas, however, not rated lower due to land costs

MINERAL RESOURCES

Possible Sand and Gravel Reserves

- rated medium because the loss of the resource would be small due to the small size of the tower site needed (i.e., 30 metres square) and the quantity and quality of the resource is variable

- these areas, however, are not rated lower because they do represent policy areas as defined by MNR

Existing Mineral Industries (Pits and Quarries)

- rated high due to the high level of capital investment and expected high quality of the resource present

RECREATIONAL RESOURCES

Existing Recreation Areas

- rated high because a tower could eliminate a portion of an operation or physically interfere with recreational activities resulting in a loss of recreational opportunities

- a tower located in such areas may detract from the recreationist's expectations

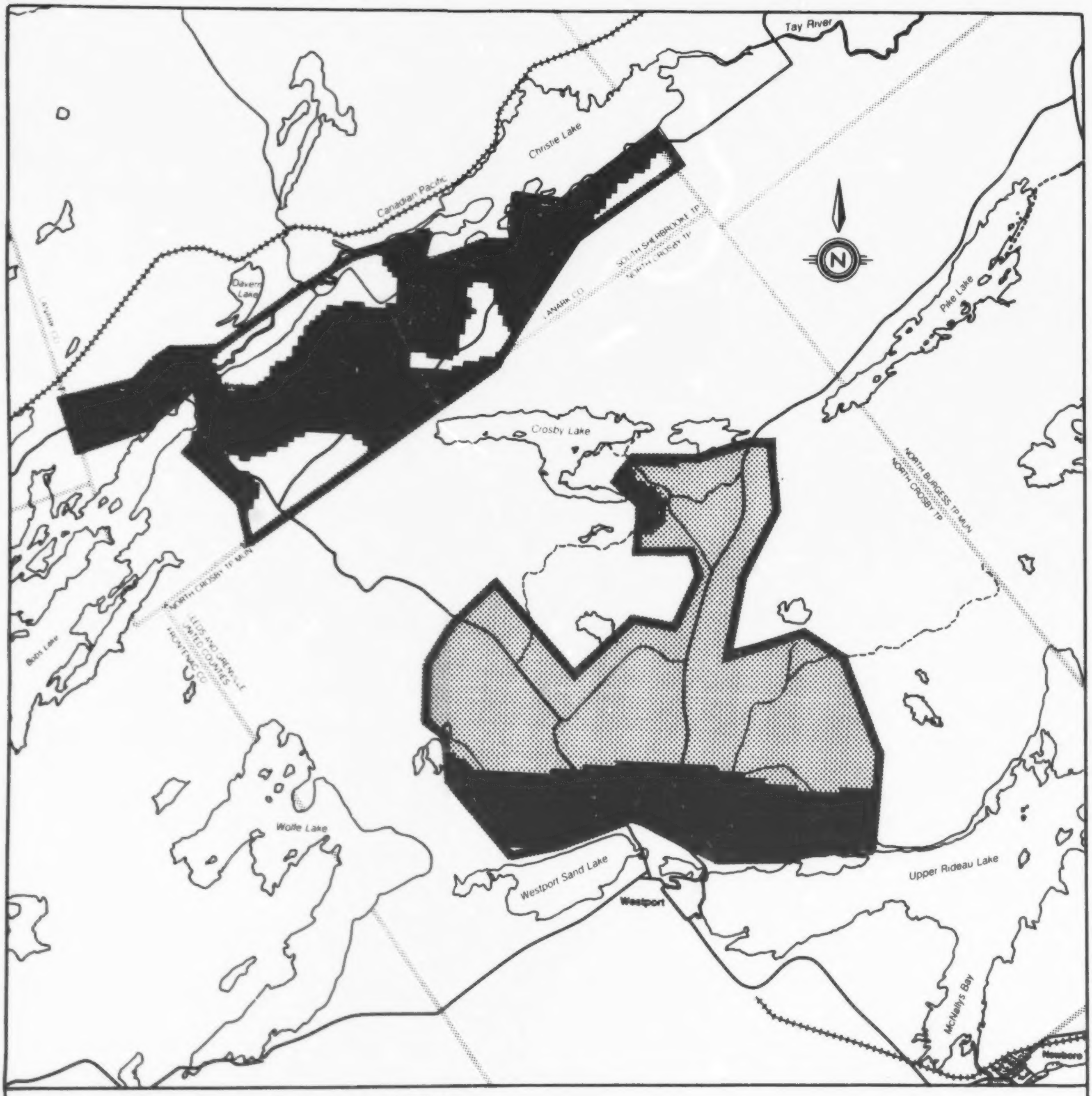
- recreation areas are generally frequented by a number of people thus the visual impact becomes greater

Proposed Recreational Areas

- rated medium due to a level of development uncertainty associated with such areas and lower degree of commitment as compared to an established area

APPENDIX D6

ENVIRONMENTAL FACTOR AND COMPOSITE CONSTRAINT MAPS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Davern Lake
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Lanark Co
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North Crosby TP
Crosby Lake
Pike Lake
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North Crosby TP
North Crosby TP MUN
Leeds and Grenville United Counties
Frontenac Co
Bobs Lake
Wolfe Lake
Westport Sand Lake
Westport
Upper Rideau Lake
McNallys Bay
Newboro
N

Eastern Ontario Study – Telecommunications
North Crosby/South Sherbrooke Study Area

Appearance of the Landscape

Legend

▮▮▮▮▮▮▮ Study Area Boundary

■ High Constraint

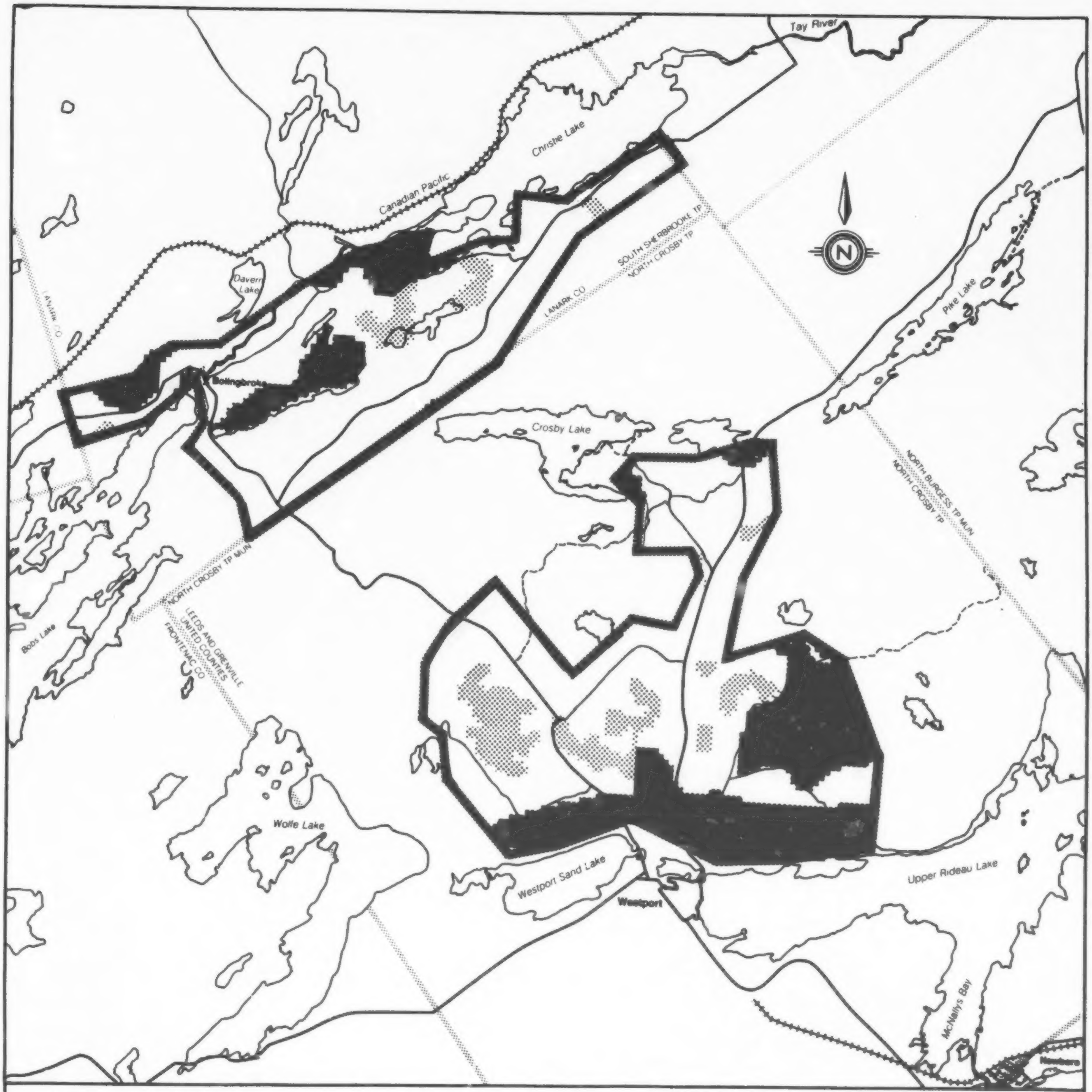
■ Medium Constraint

▨ Low Constraint

Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres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LEEDS AND GRENVILLE UNITED COUNTIES
FRONTENAC CO
Bobs Lake
Wolfe Lake
Westport Sand Lake
Westport
Upper Rideau Lake
McNallys Bay
Newboro

Eastern Ontario Study – Telecommunications
North Crosby/South Sherbrooke Study Area

Biological Resources

Legend

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■ Medium Constraint

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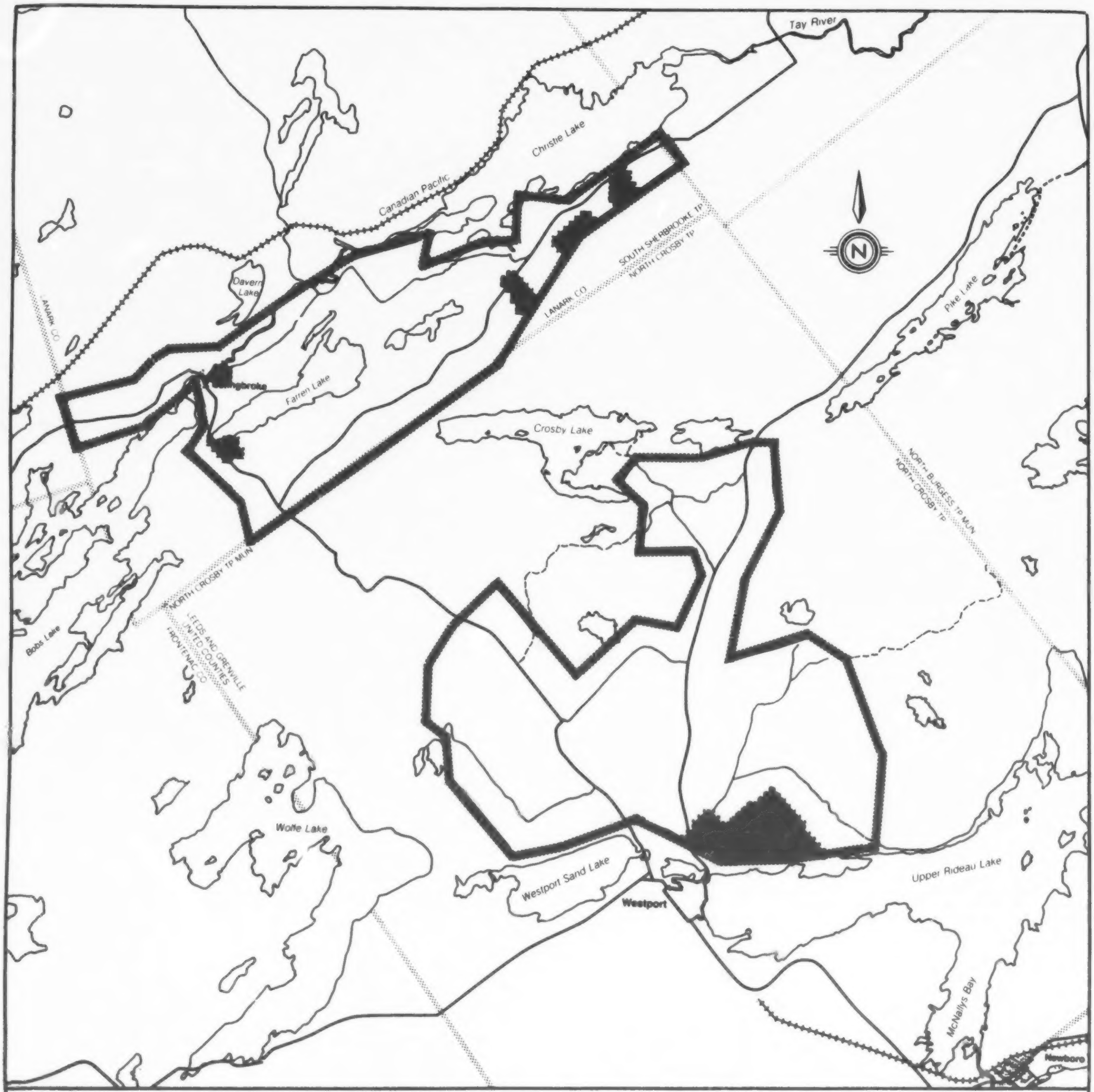
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Frontenac Co
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Westport
Upper Rideau Lake
McNallys Bay
Newboro
N

Eastern Ontario Study – Telecommunications
North Crosby/South Sherbrooke Study Area

Forest Resources

Legend

▮▮▮▮▮▮▮ Study Area Boundary

■ High Constraint

Scale

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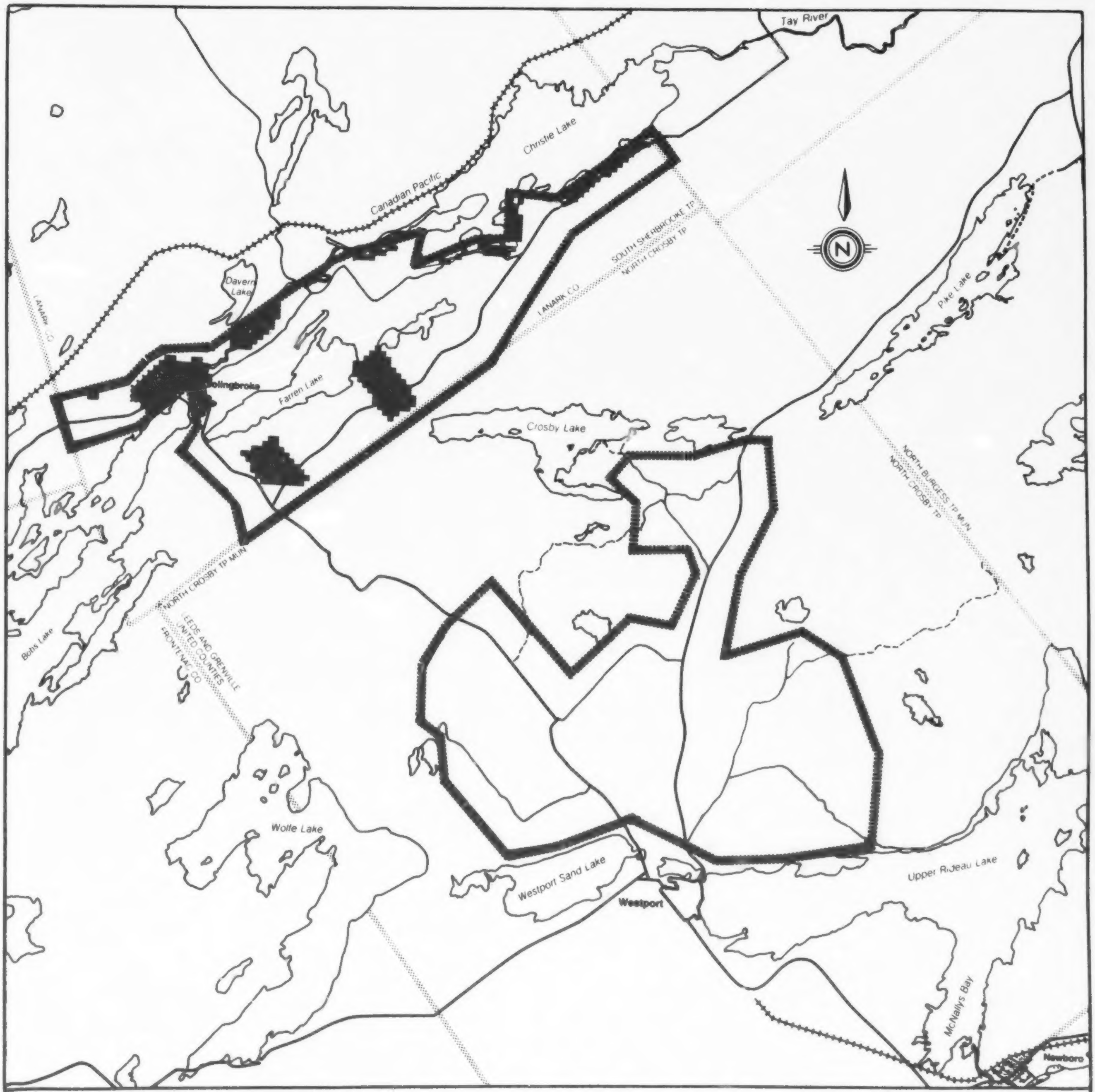
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Westport
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McNally's Bay
Newboro

Eastern Ontario Study – Telecommunications
North Crosby/South Sherbrooke Study Area

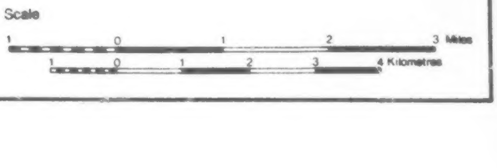
Heritage Resources

Legend

IIIIIII Study Area Boundary

■ High Constraint

■ Medium Constraint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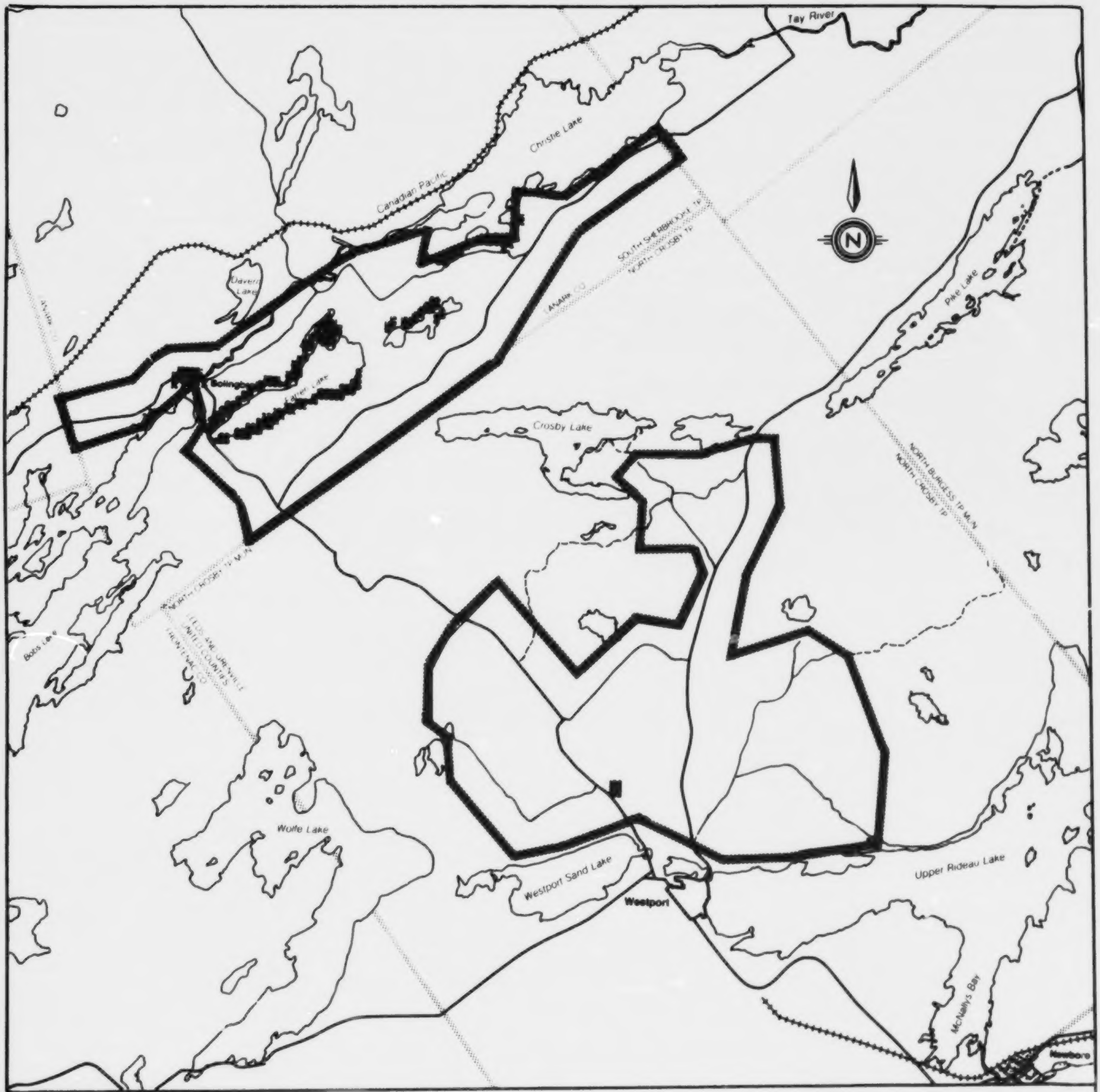
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McNallys Bay
Newboro

Eastern Ontario Study – Telecommunications
North Crosby/South Sherbrooke Study Area

Human Settlement

Legend

▮▮▮▮▮▮▮ Study Area Boundary

■ High Constraint

Scale

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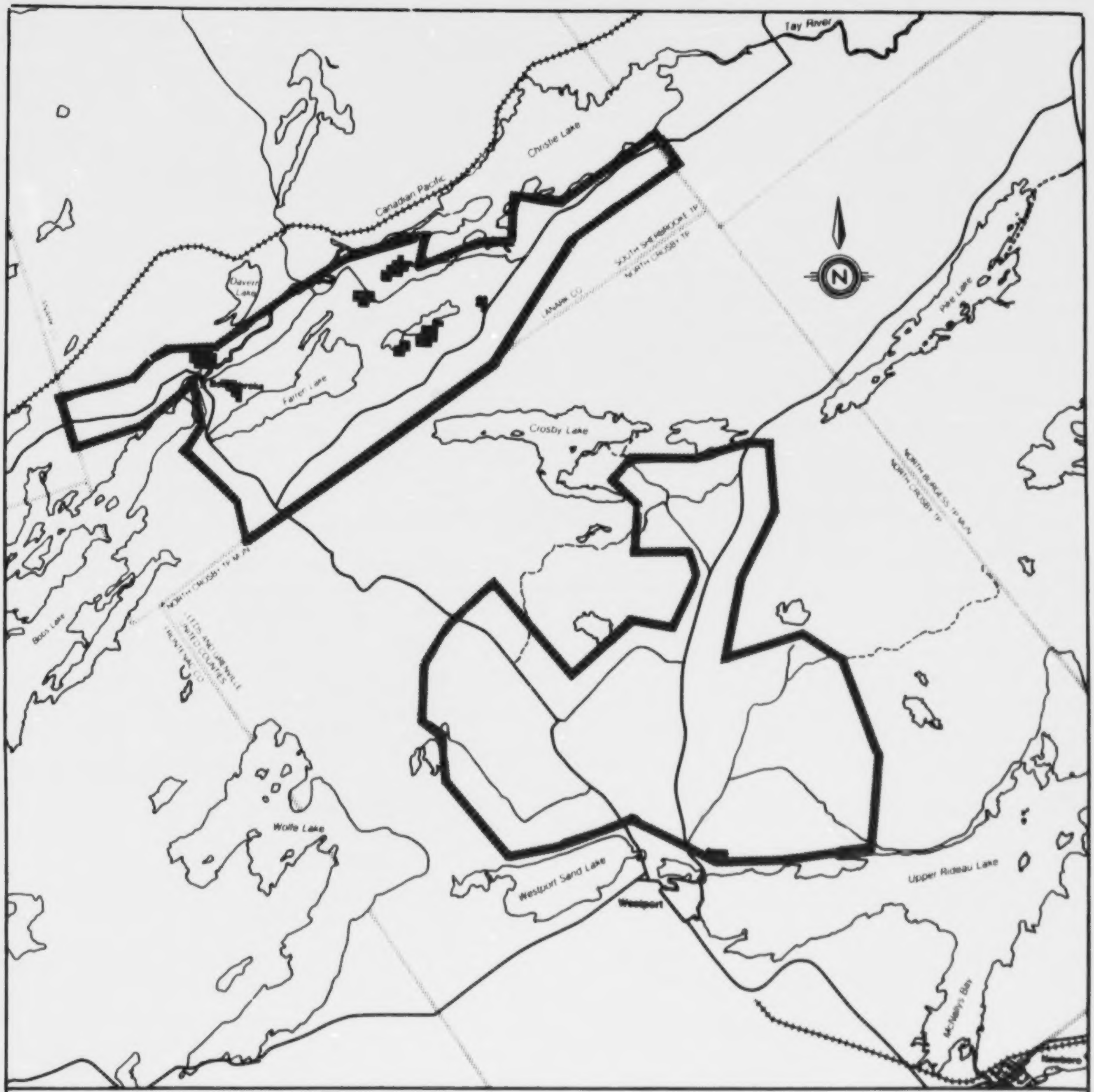
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FRONTENAC CO
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Westport
Upper Rideau Lake
McNally's Bay
Newboro

Eastern Ontario Study – Telecommunications
North Crosby/South Sherbrooke Study Area

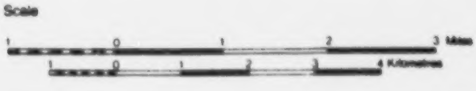
Mineral Resources

Legend

▮▮▮▮▮▮▮ Study Area Boundary

■ High Constraint

■ Medium Constraint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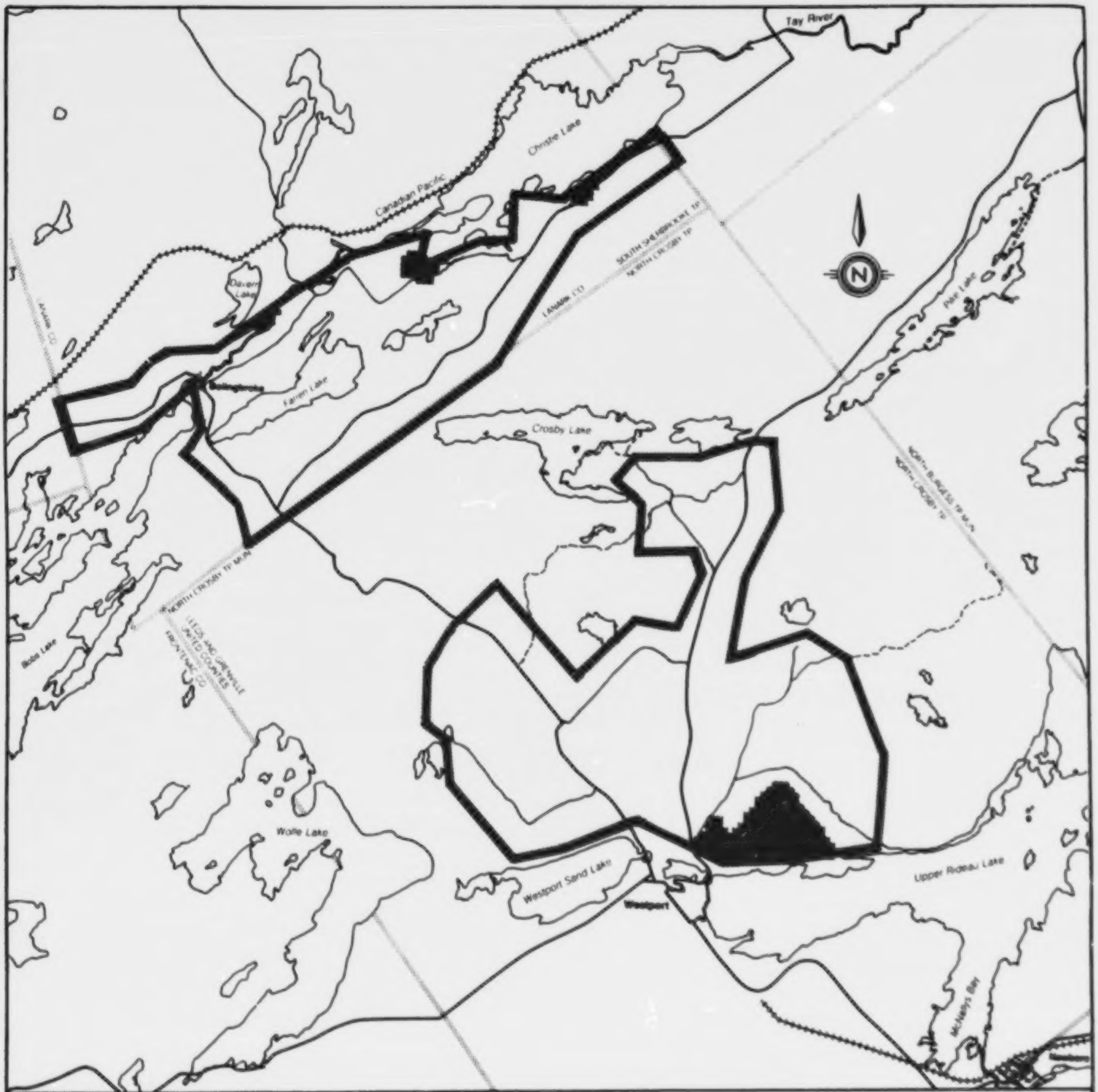
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Westport Sand Lake
Westport
Upper Rideau Lake
McNallys Bay

Eastern Ontario Study – Telecommunications
North Crosby/South Sherbrooke Study Area

Recreation Resources

Legend

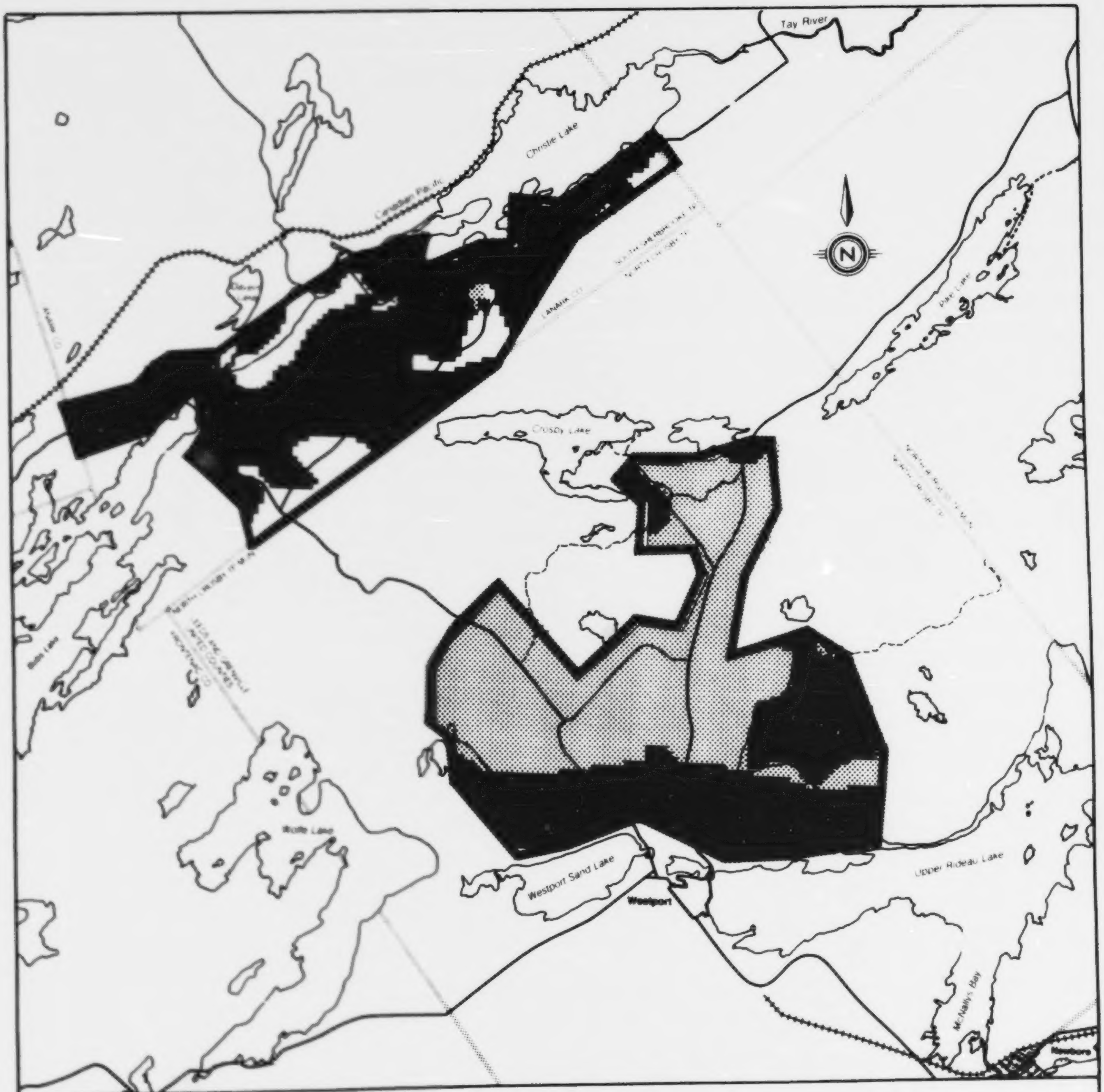
▮▮▮▮▮▮▮ Study Area Boundary

■ High Constraint

Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres


Tay River
Christie Lake
Canadian Pacific
Lanark Co.
Crosby Lake
Bob's Lake
Wolfe Lake
Pike Lake
Westport Sand Lake
Westport
Upper Rideau Lake
McNally's Bay
Newboro
N

Eastern Ontario Study – Telecommunications
North Crosby/South Sherbrooke Study Area

Composite Environmental Constraints

Legend

▮▮▮▮▮▮▮ Study Area Boundary

■ High Constraint

■ Medium Constraint

▨ Low Constraint

☐ No Known Constraint

Scale

1 0 1 2 3 Miles

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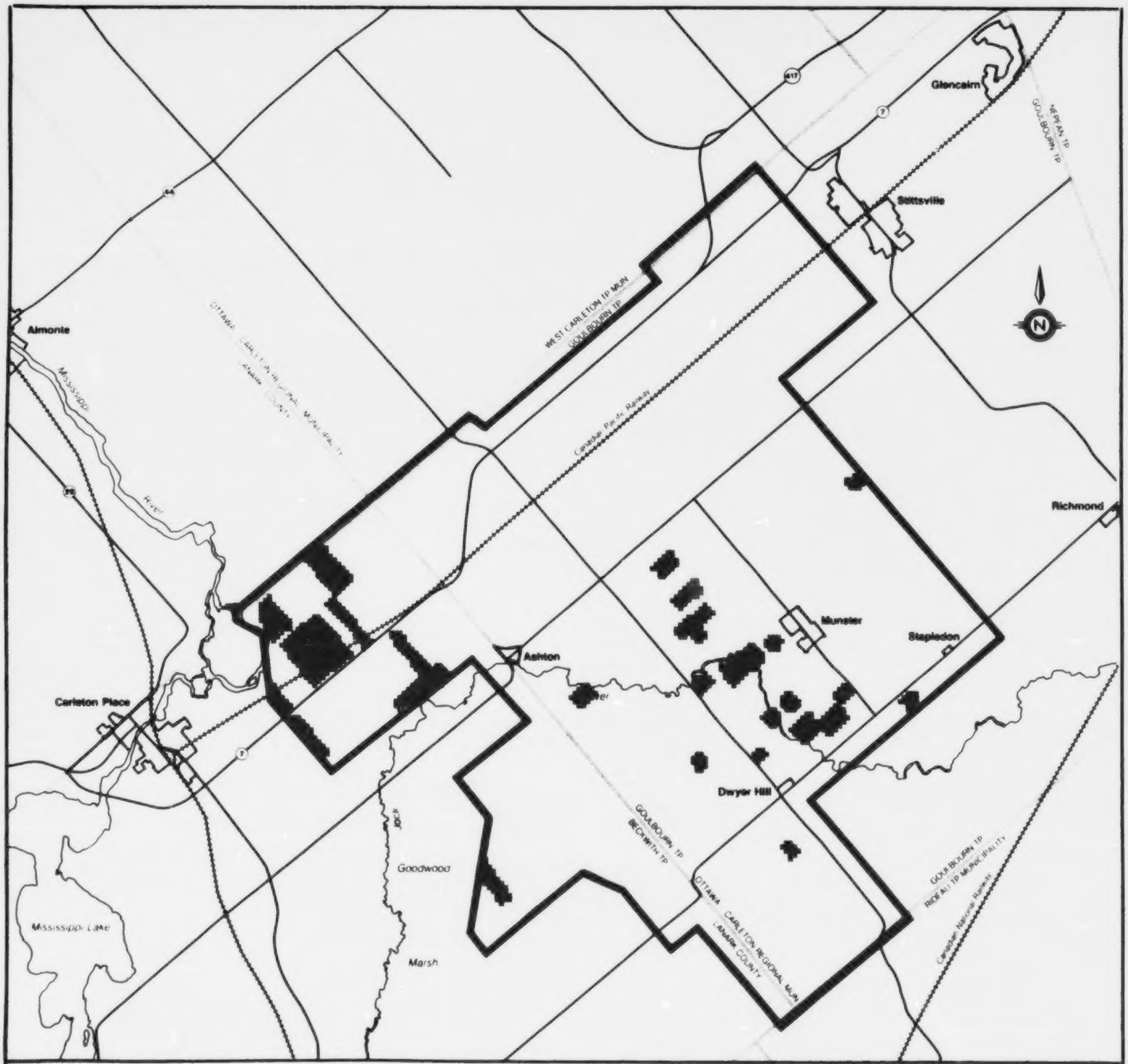
Glencairn
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Canadian Pacific Railway
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Canadian National Railway
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Eastern Ontario Study – Telecommunications
Goulbourn/Beckwith Study Area

Agricultural Resources (Tile Drained Fields)

Legend:

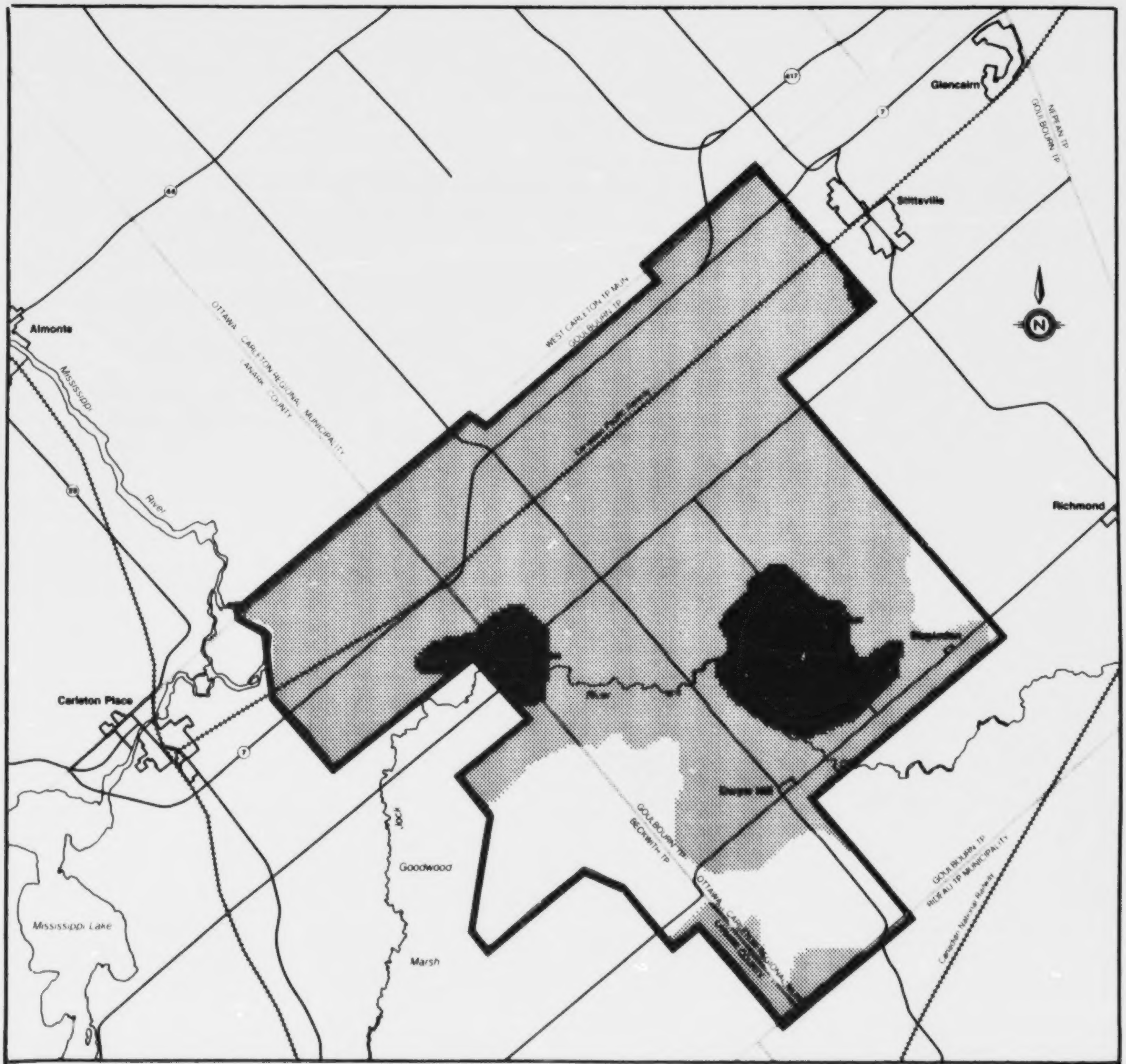
▮▮▮▮▮▮▮ Study Area Boundary

■ High Constraint

Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres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Canadian National Railway

Eastern Ontario Study – Telecommunications
Goulbourn/Beckwith Study Area

Appearance of the Landscape

Legend:

▮▮▮▮▮▮▮ Study Area Boundary

■ Medium Constraint

▨ Low Constraint

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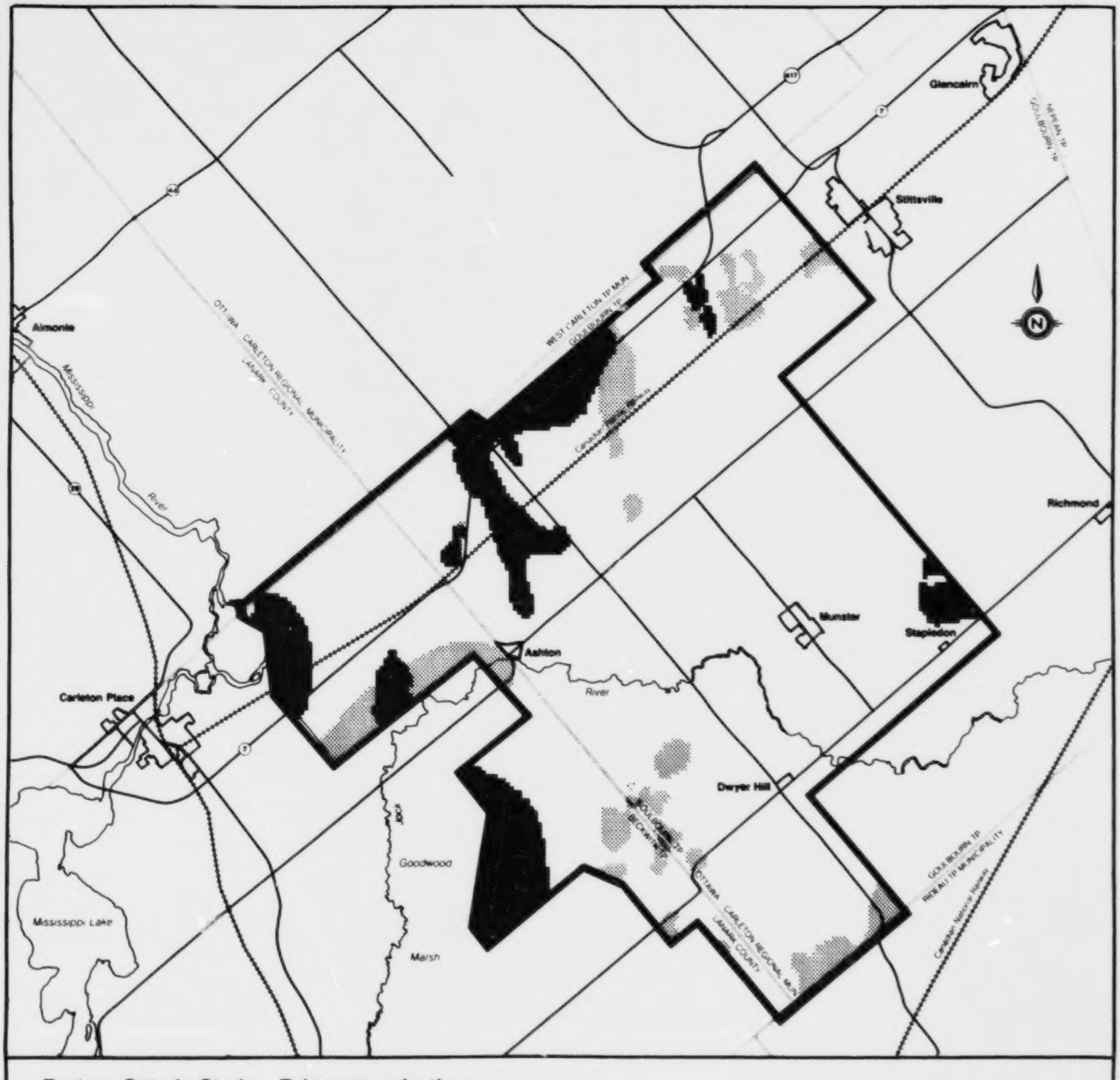
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Canadian National Railway
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Eastern Ontario Study – Telecommunications
Goulbourn/Beckwith Study Area

Biological Resources

Legend:

▮▮▮▮▮▮▮ Study Area Boundary

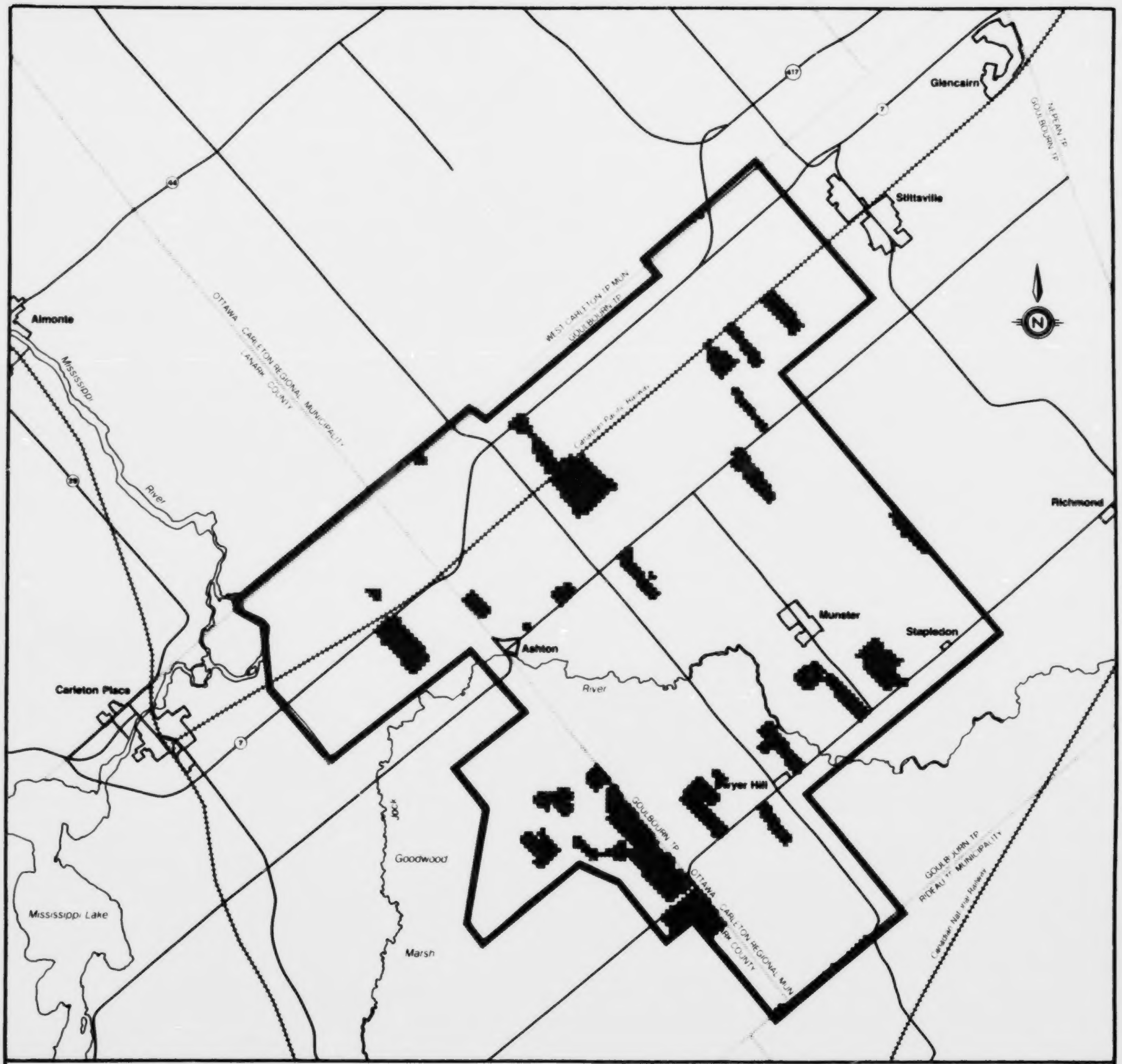
■ High Constraint

▨ Low Constraint

Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres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RIDEAU TP MUNICIPALITY
Canadian National Railway

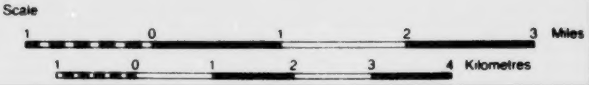
Eastern Ontario Study – Telecommunications
Goulbourn/Beckwith Study Area

Forest Resources

Legend:

▮▮▮▮▮▮▮ Study Area Boundary

■ High Constraint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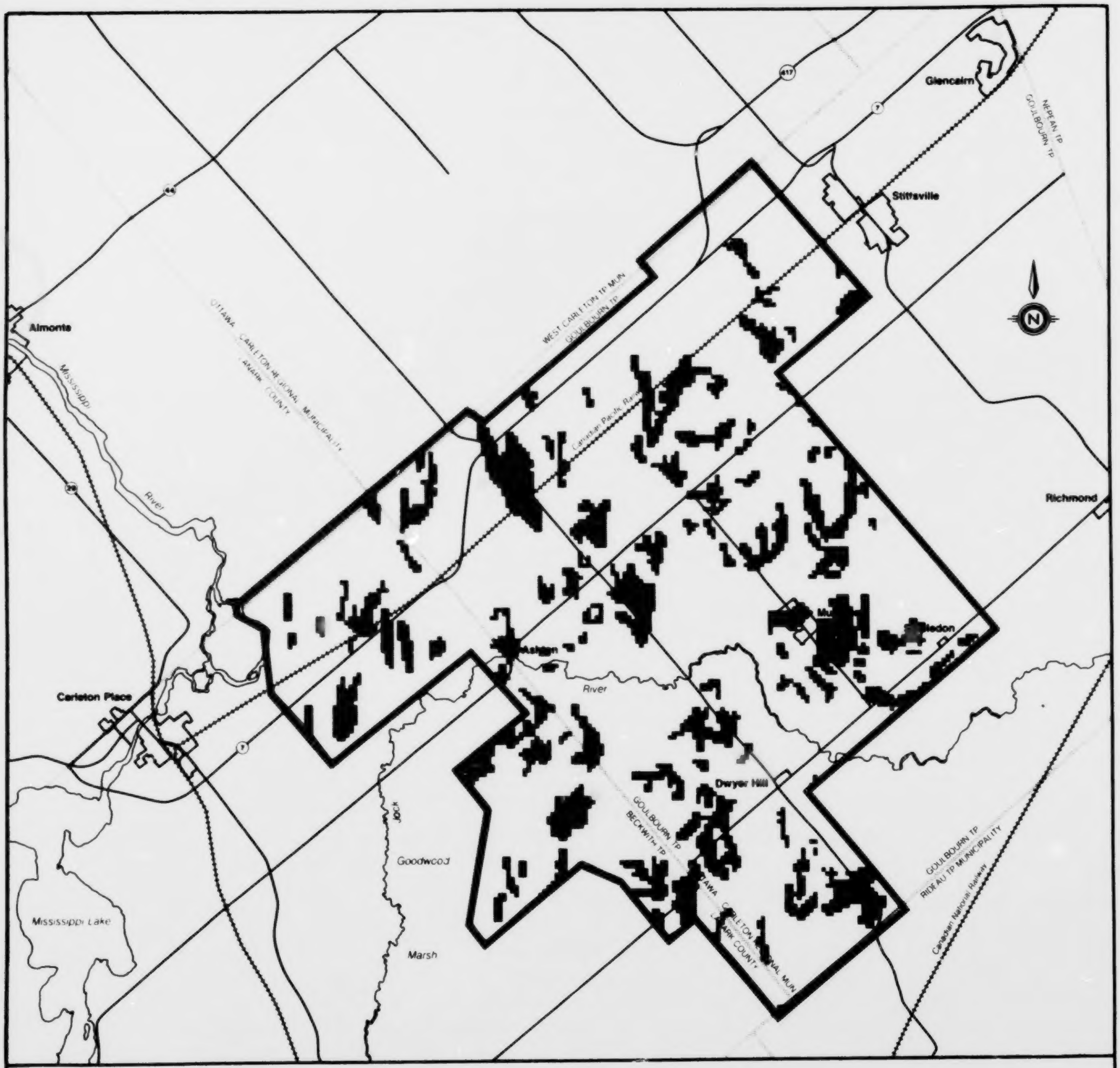
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Canadian Pacific Railway
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BECKWITH TP
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Goodwood
Marsh
Mississippi Lake
GOULBOURN TP
RIDEAU TP MUNICIPALITY
Canadian National Railway
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Eastern Ontario Study – Telecommunications
Goulbourn/Beckwith Study Area

Heritage Resources

Legend:

▮▮▮▮▮▮▮▮ Study Area Boundary

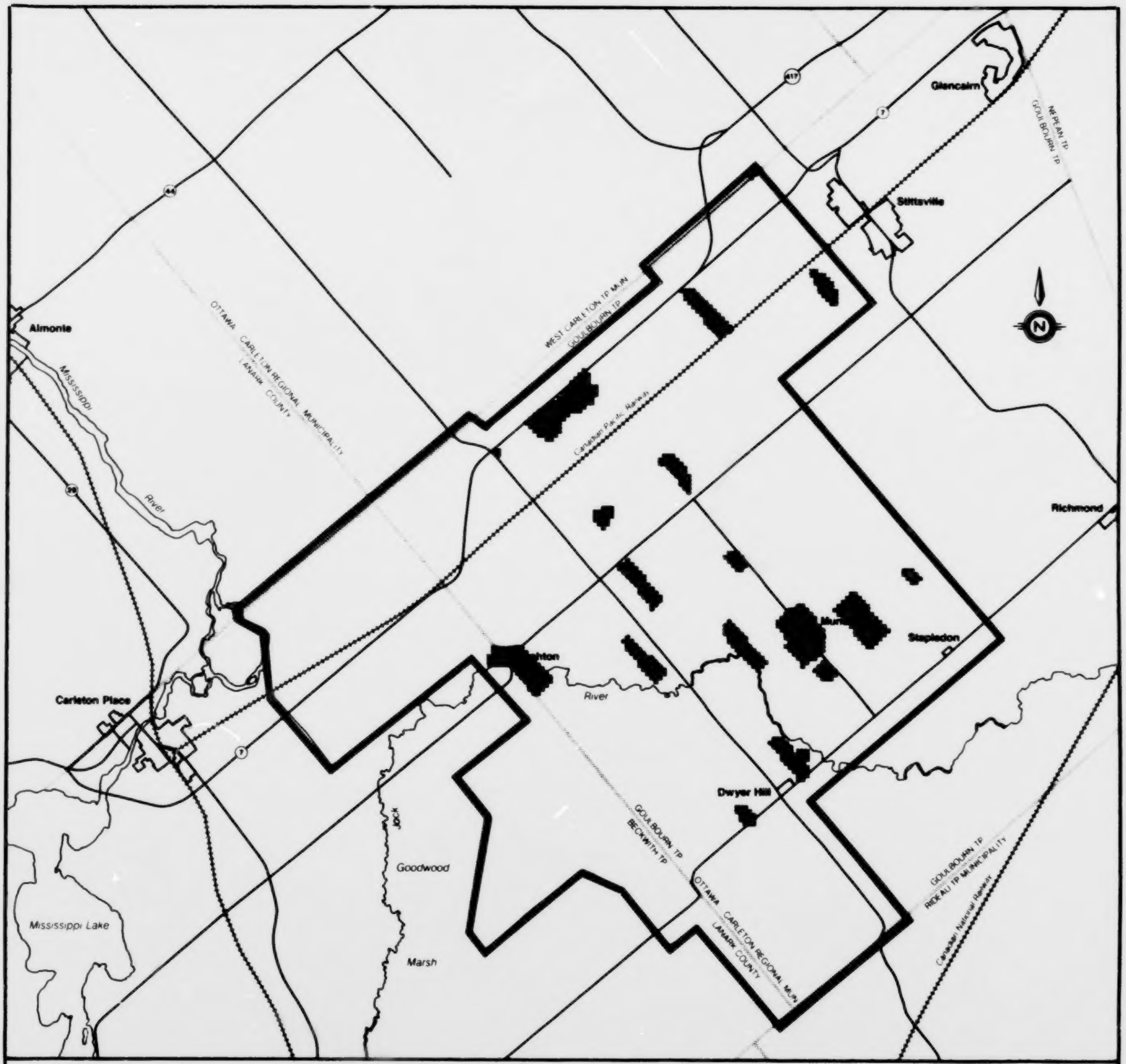
■ High Constraint

■ Medium Constraint

Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres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OTTAWA CARLETON REGIONAL MUN
LANARK COUNTY
GOULBOURN TP
RIDEAU TP MUNICIPALITY
Canadian National Railway

Eastern Ontario Study – Telecommunications
Goulbourn/Beckwith Study Area

Human Settlement

Legend:

▮▮▮▮▮▮▮ Study Area Boundary

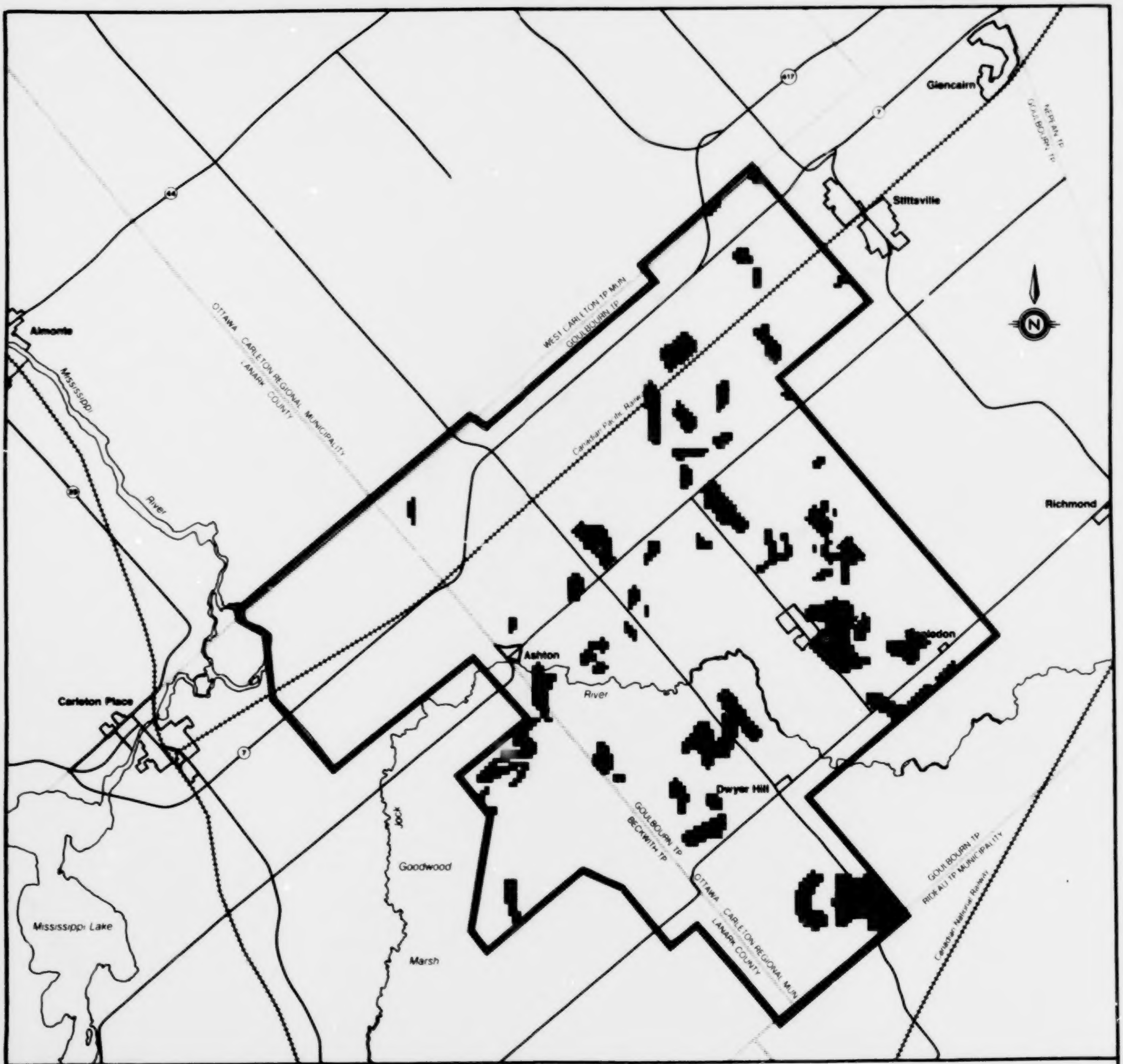
■ High Constraint

■ Medium Constraint

Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres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BECKWITH TP
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LANARK COUNTY
GOULBOURN TP
RIDEAU TP MUNICIPALITY
Canadian National Railway
Mississippi Lake
Marsh

Eastern Ontario Study – Telecommunications
Goulbourn/Beckwith Study Area

Mineral Resources

Legend:

▮▮▮▮▮▮▮ Study Area Boundary

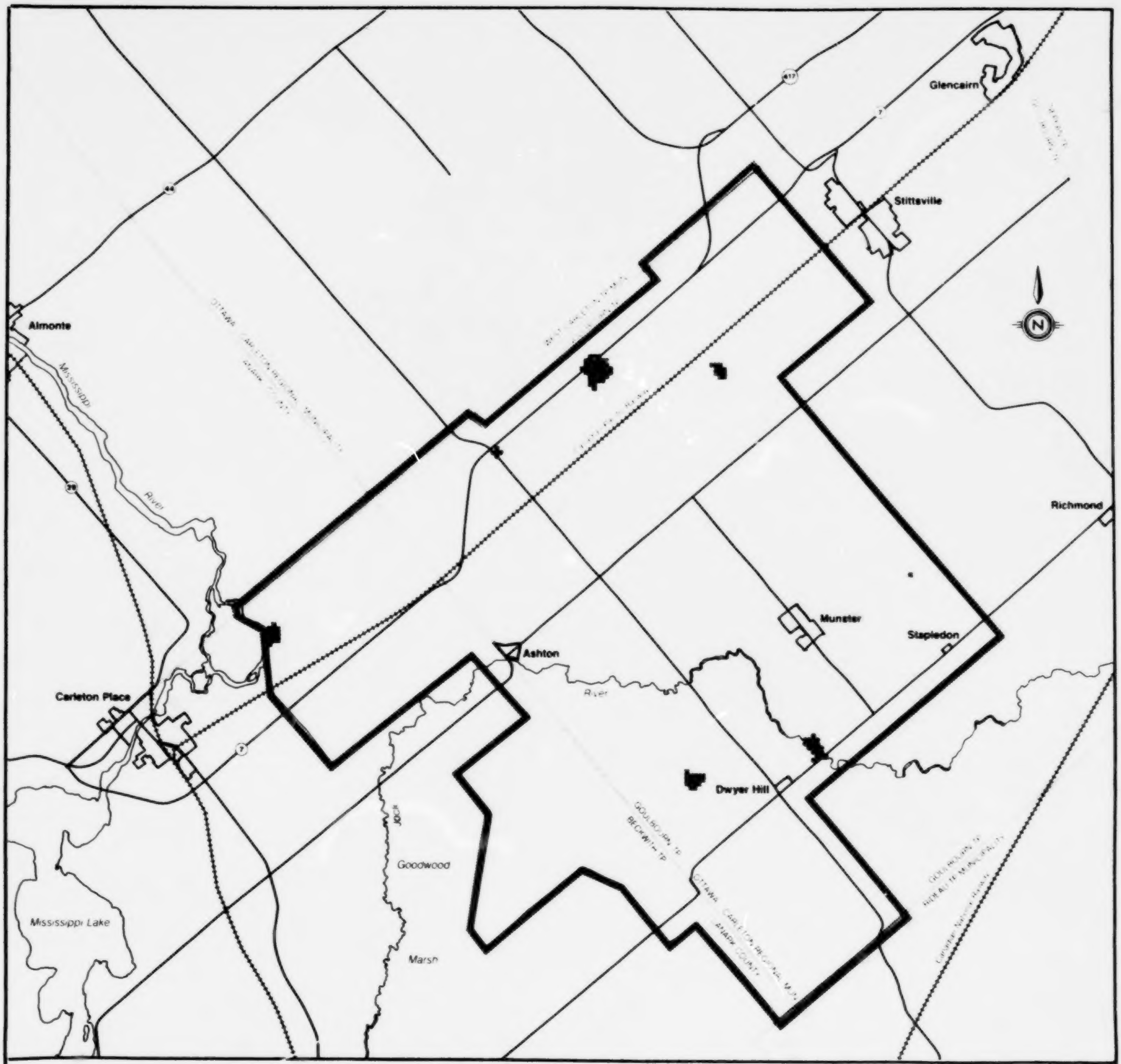
■ High Constraint

■ Medium Constraint

Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres


Glencairn
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Richmond
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River
Carleton Place
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Dwyer Hill
Jock
Goodwood
Marsh
Mississippi Lake
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Eastern Ontario Study – Telecommunications
Goulbourn/Beckwith Study Area

Recreation Resources

Legend:

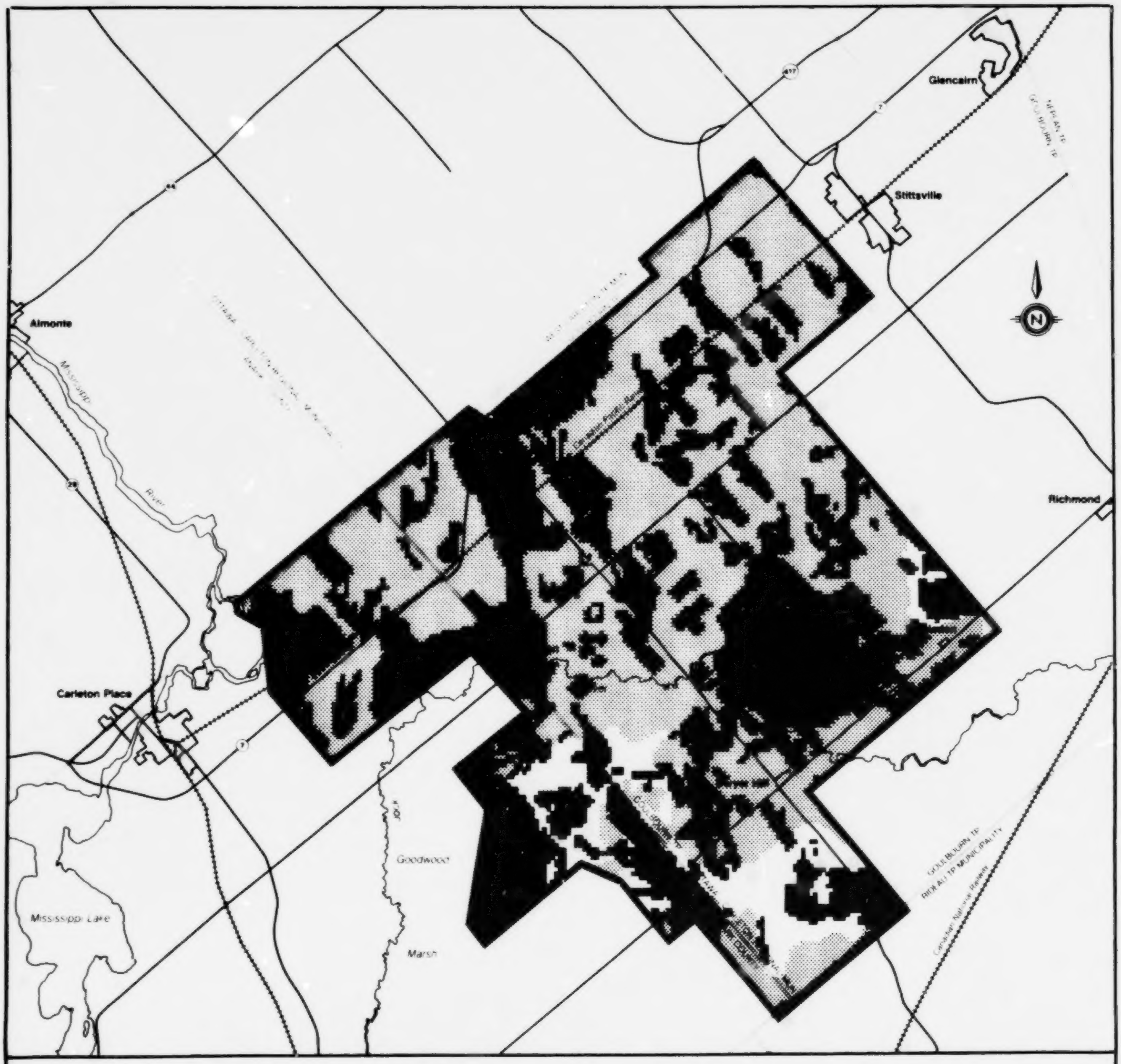
▮▮▮▮▮▮▮ Study Area Boundary

■ High Constraint

Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres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Carleton Place
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Goodwood
Marsh
Mississippi Lake
GOULBOURN TP
RIDEAU TP MUNICIPALITY
Canadian National Railway

Eastern Ontario Study – Telecommunications
Goulbourn/Beckwith Study Area

Composite Environmental Constraint Map

Legend:

▮▮▮▮▮▮▮▮ Study Area Boundary

■ High Constraint

■ **Medium Constraint**

▒ Low Constraint

☐ No Known Constraint

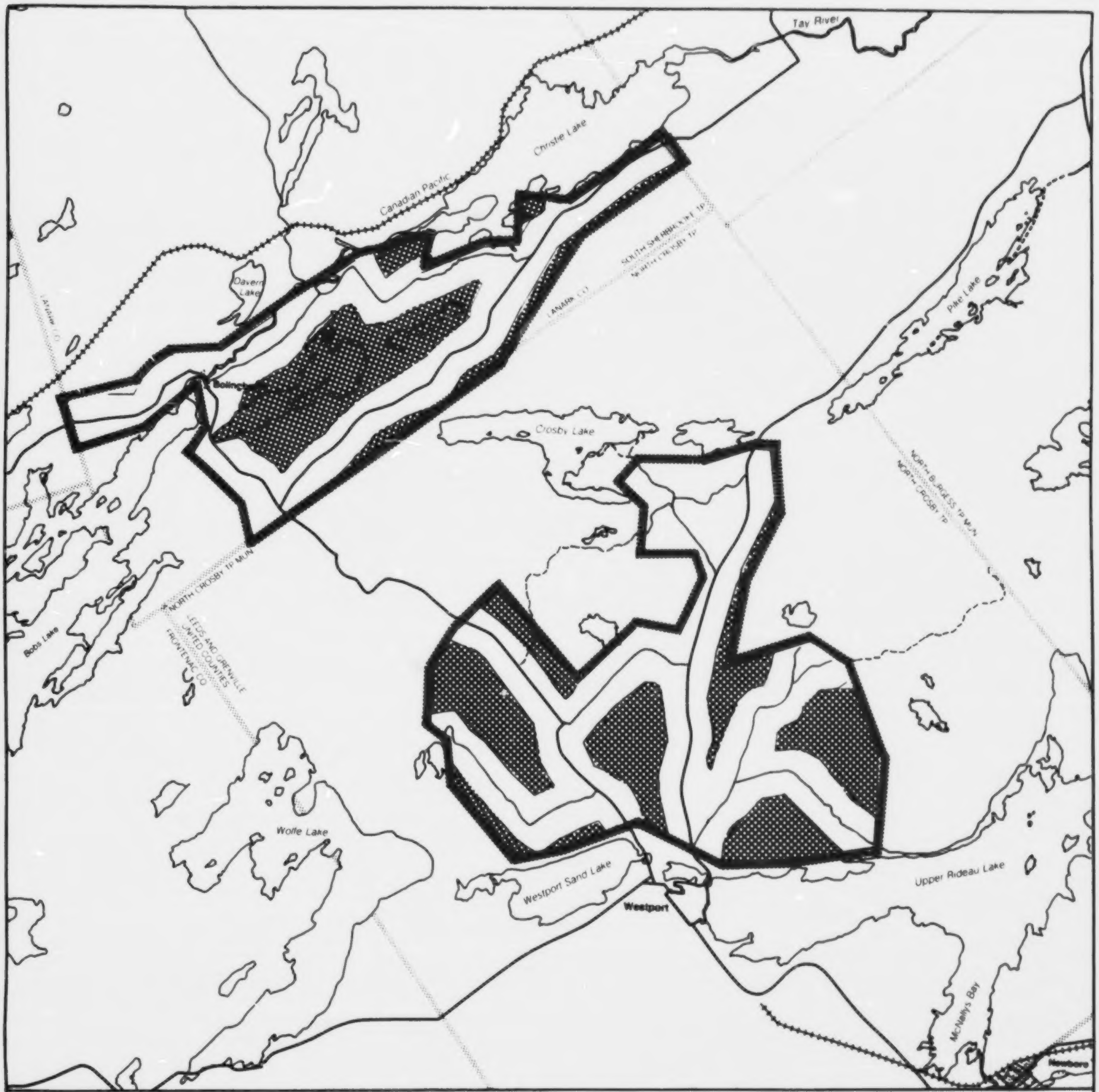
Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres

APPENDIX D7

TECHNICAL CONSTRAINT MAPS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Christie Lake
Canadian Pacific
Davern Lake
Bolingbroke
LANARK CO
SOUTH SHERBROOKE TP
NORTH CROSBY TP
Pike Lake
Crosby Lake
NORTH BURGESS TP MUN
NORTH CROSBY TP
NORTH CROSBY TP MUN
LEEDS AND GRENVILLE UNITED COUNTIES
FRONTENAC CO
Bobs Lake
Wolfe Lake
Westport Sand Lake
Westport
Upper Rideau Lake
McNallys Bay
Newboro

Eastern Ontario Study – Telecommunications
North Crosby/South Sherbrooke Study Area

Technical Constraint Map

Legend

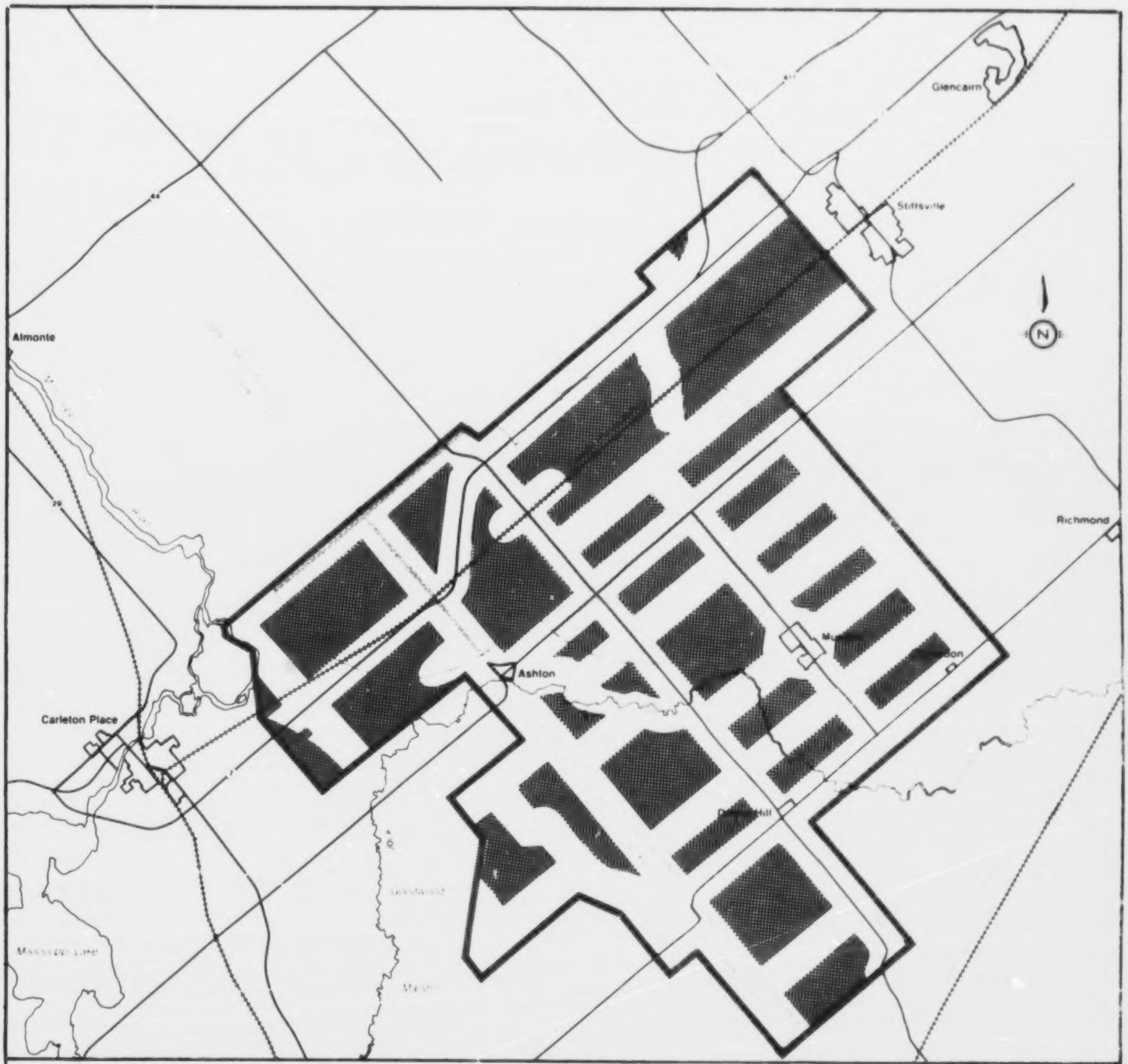
▮▮▮▮▮▮ Study Area Boundary

■ High Constraint

Scale

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres


Glencairn
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Stittsville
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Almonte
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Richmond
Ashton
Carleton Place
Mississippi Lake
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Eastern Ontario Study – Telecommunications
Goulbourn/Beckwith Study Area

Technical Constraint Map

Legend:

IIIIIII Study Area Boundary

■ High Constraint (area farther than 0.25 miles from an all-weather access road)

■ Medium Constraint (area within a 2.0 mile radius of a radio)

Scale
1 0 1 2 3 Miles
1 0 1 2 3 4 Kilometres

APPENDIX D8

SITE SELECTION DATA TYPES AND SOURCES

Data Types	Sources
- farms, residences (permanent and seasonal), human settlement concentrations	- 1:50,000 National Topographic Series (NTS) maps)
- land use (i.e., agricultural lands, mineral extraction, recreation areas)	- 1:50,000 air photo mosaics - East Route Study data file - field observations - 1:50,000 NTS maps
- forest cover	- East Route study data file - 1:15,000 air photo mosaics - field observations
- soils	- The Soils of Lanark County, Report No. 40, 1967, 1:50,000 - The Soils of Leeds County, Report No. 41, 1968, 1:50,000 - Soils of Goulbourn Twp, Regional Municipality of Ottawa-Carleton, 1983 (Final Preliminary Map), 1:50,000
- topography (i.e., elevations)	- 1:50,000 NTS maps - field observations
- property ownership	- assessment rolls (1982)
- municipal planning designations (i.e., land use designations, zoning)	- Tay Valley Official Plan - North Leeds Official Plan - North Lanark Official Plan - Regional Municipality of Ottawa-Carleton Official Plan - South Sherbrooke Township Zoning By-law No. 502 as amended by By-law No. 524 - North Crosby Township Zoning By-law No. 83-5 - Goulbourn Township By-law No. 77-60 - Beckwith Township Zoning By-law No. 79-18

APPENDIX E

CONSOLIDATION OPTIONS

The following consolidation options between point A and Hawthorne TS were used in the evaluation.

Link A-D

Mount Chesney to Point D

Parallel the existing line on the west side with the first line. Between Mount Chesney and the Town of Battersea rebuild existing line with the second line. North of the Town of Battersea to Point D, parallel the existing line on the west side.

Link B-E

Intersection of 115 kV Line to North End of Howes Lake

Remove the existing 115 kV line and combine with 500 kV adjacent to the 230 kV lines. Build the second line on the east side of the combined line except where the 115 kV line deviates from the right of way. In this area follow the existing 115 kV right of way.

Link D-I

Rebuild the existing lines with the second line and parallel with the first line. Expand the right of way to the west. For a distance of 2.0 km at Jones Falls realign the right of way.

Link G-H

Point G to Lot 8, Concession 10, Bedford Township

Parallel the existing lines on the south side.

Lot 8, Concession 10, Bedford Township to Point H

Parallel the existing lines on the south side with the first line. Rebuild the north 230 kV line with the second line.

Link H-I

Parallel the existing lines on the south side with the first line. Rebuild the north 230 kV line with the second line.

Link I-L

Point I to Smiths Falls TS

Expand the right of way to the west. Parallel with the first line. Rebuild the existing line with the second line.

Smiths Falls TS to Richmond DS

Remove existing 115 kV wood pole line and build the new lines.

Link E-F

Parallel the existing 115 kV line on the east side.

Link F-J

Parallel the existing 115 kV line on the east side.

Other Considerations

For 1.0 km at Bobs Lake, consider expanding the right of way to the west in order to avoid crossing the lake and removing residences.

Link J-Q

Point J to Bolton Creek

Parallel the existing line on the east side.

Concession IV Ramsay Township to Point Q

Parallel the existing line on the north side and combine the existing 230 kV line with the second line.

Link Q-R

Intersection with Existing 230 kV to Point R

Parallel the existing line on the north side and rebuilt the 230 kV with the second line.

Richmond DS to Point Y

Parallel the existing 115 kV line with the first line. Combine the existing 115 kV line with the second line.

Link R-Y

Consolidate both lines with the existing lines.

Point Y - Hawthorne TS

Combine new 500 kV circuits with the existing lines.

APPENDIX F

RATIONALE FOR LOCATION AND DETAILED DESCRIPTION OF ALTERNATIVE ROUTES

F.1 Blue Route (ABEF JQRY)

. ABEF

The Blue Route alternative passes through Kingston Township on Hydro-owned property between the existing 230 kV transmission lines (point A to B). At Cataraqui TS (Lot 2, Concession 1, Portland Township), the route passes the station to the east. Ontario Hydro owns sufficient property to the east of the station to accommodate the new lines without removing any homes. West of the station, it would be necessary to acquire more property and remove two or three homes.

Through Portland Township, the route parallels the existing right of way on the east side because fewer residences and farms would be affected and extra crossovers of the existing lines would be avoided. There would also be less effect on cottagers at Howes Lake, and less effect at the Millhaven Creek crossing, the Cameron Swamp, and the wetlands at Howes Lake.

Through Hinchinbrooke and Bedford townships, the route parallels the existing 115 kV line. At Bobs Lake the existing right of way is close to the lake and several residences.

. JQ

The route continues to follow the 115 kV line through Oso Township, east of Sharbot Lake. The alignment to the east side would reduce the visibility of the new lines from Sharbot lake, and maintain the existing tree cover on the shore line.

The Blue Route continues north, crossing the Fall River and Highway 7, and turns east in Lot 22, Concession 6, Oso Township, just south of Bolton Creek. A crossing on the north side of the creek would affect more houses, be more visually dominant and effect more good quality forests. South of Bolton Creek, the location of the route avoids existing buildings and crests to reduce visibility.

The route continues in a northeasterly direction following the existing township line between North and South Sherbrooke to avoid diagonal severances. This alignment also avoids existing buildings, major crests and some of the best timber stands. The route veers slightly to the north into Lot 1 in Concession 4, of North Sherbrooke Township, to minimize potential effects on a heronry and avoid a seasonal residence. The route then returns to the township line to avoid the better forests in the northern part of the corridor.

The route continues east through the middle of Lot 1, in Dalhousie Township, until Concession 10 where it angles northward towards the Mississippi River. The crossing of the Mississippi River is aligned to avoid buildings along County Road 12, cottagers on the river, a large wetland surrounding Big Mud Lake and actively farmed areas and maple sugar bushes west of Watsons Corners.

Line
Numbers

West of Watsons Corners, the route turns east to parallel the township fabric. The route follows field edges and avoids the concentration of homes along County Road 8.

The route turns northeast just west of the Dalhousie/Lanark Township line. The alignment would minimize effects on agriculture by utilizing forest edges and crossing actively cultivated areas in the narrowest areas.

West of County Road 1, Lanark Township, the route turns east to parallel the lot fabric. The north half of the corridor includes Baxter Lake and a concentration of cottages on the Clyde River. The route crosses the Clyde River once but minimizes the amount of wetland crossed and avoids the oxbows to the south.

The route turns north in the east half of Concession 5. This shift to the north was made to parallel the property fabric between lots 12 and 13. The turn avoids buildings and would minimize the effect on a wetland area.

In Concession 6, Lanark Township, the route turns east to parallel the property fabric between lots 12 and 13 and continued into Ramsay Township to the eastern edge of Concession 2. This alignment would minimize conflicts with existing land uses by paralleling the township fabric. It avoids all existing buildings, most of the good farm land, an existing pit (Concession 7), and a maple sugar bush in Concession 9, Lanark.

East of County Road 9, Concession 2, Ramsay Township, the route turns northeast to minimize effects on agricultural and natural systems by following the interface between the farmed and wooded areas. This would reduce interference with agricultural operations and avoids the interior of Wolfe Grove, which is relatively undisturbed.

In Concession 4, Ramsay Township, the route turns southeast to parallel the existing transmission line. The route parallels the north side of the right of way to avoid passing over Almonte TS, which is is adjacent to the south side of the existing line. For technical reasons, the 500 kV lines cannot go over the station and so a diversion to the south of the station or a shift to the north side of the right of way was necessary. In addition, paralleling on the south side of the right of way would require two extra crossovers and would affect more homes.

. QR

The route separates from the existing right of way in Lot 2, Concession 5, in West Carleton Township to avoid the residential and commercial developments in Stittsville and Amberwood Village, and to parallel the major Highway 417 severance.

The route parallels Highway 417 until the first concession in the City of Kanata, where it turns south, following the Carp River channalization. This location avoids built-up areas and utilizes field edges along the drainage system.

In Kanata, the Blue Route rejoins the existing right of way and turns eastward to pass through the Bridlewood development east of County Road 40, on an existing Ontario Hydro right of way.

. RY

The route parallels the existing right of way through the Stony Swamp to minimize effects on this area by concentrating the transmission lines in one location.

F.2 Red Route (ABEF JKPRY)

- ABEF J

The Red Route is the same as the Blue Route to point J.

- JK

At point J, the Red Route turns eastward and continues in a relatively straight line, through South Sherbrooke Township, until it reaches Lot 14 in Concession 6, in Bathurst Township.

The route parallels the township fabric through South Sherbrooke and generally avoids a number of large wetlands, particularly in lots 8 through 11. The route passes through the centre of the corridor and avoids the viewsheds of Rock and Little Silver lakes, and the proposed residential development at the Maberly Pines Subdivision on the east side of County Road 5 (Lot 13, Concession 6, South Sherbrooke).

In the vicinity of McGowan Lake, there are a number of identified constraints. A private campground belonging to the Reorganized Church of Jesus Christ of Latter Day Saints, a communications tower, residences along the Brook Valley Road, McGowan Lake Family Campground, a sand and gravel pit, a Woodlot Agreement Improvement (WIA) Forest, maple sugar bushes, and the viewshed of Highway 7, all influenced the route location. The route selected avoids all facilities except the southern boundary of the church campground. It was not possible to avoid the viewsheds of these features or the viewshed of Highway 7.

The route continues eastward through Bathurst Township, north of Highway 7. It avoids a large wetland in lots 3 and 4, Concession 6, and crosses the narrow portion of a treed wetland in lots 7 and 8. The route also avoids a wetland in Lot 9, Concession 7, and a number of WIA's in lots 8 and 9 in both concessions.

In Lot 14, the route swings south to the middle of Concession 6 to avoid the hamlet of Harper and to minimize effects on agriculture.

The route parallels the back lot lines through Concession 6, in Bathurst Township, and through to Concession 6, Lot 11, in Drummond Township. This alignment avoids the communities of Balderson and Armstrong Corners. By following the agricultural land and Blueberry Marsh interface, effects on all resources would be minimized.

In Lot 11 the route turns eastward to avoid the community of Drummond Centre, a WIA in Lot 15, Concession 6, a sugar bush in lots 18 and 19, in concessions 5 and 6, and a large wetland in lots 20, 21 and 22 in Concession 5. The route crosses a reported, but unsubstantiated, archaeological site in Lot 13, Concession 6 and a municipal dump in the north half of Lot 15, Concession 5.

The route continues straight to the south end of Lot 22, Concession 5, where it turns northward to parallel the concession lines between the fourth and fifth concession of Drummond Township, until Lot 26. This alignment was chosen because it parallels the township fabric and would minimize both forest removal and effects on agriculture.

In Lot 26 the route turns slightly east into Concession 4 of Drummond Township and continues into the fourth concession of Beckwith Township. The route avoids WIA's in the northern part of lots 9 and 10 in Concession 4, Beckwith Township and high quality timber stands in the south half of Lot 24, Concession 4, Drummond Township and in the south half of lots 8 and 9, Concession 4, Beckwith Township.

The route continues diagonally through Concession 4, where it turns northward. This turn put the route in the middle of Concession 4, where it parallels the back lot lines in that concession, to minimize potential effects on land use and agriculture. The alignment avoids Franktown to the south, an area of deer concentration in the Goodwood Marsh, and good timber stands in the north half of Concession 4.

- Sub-Alternative KPP_1R

At Point K, the route turns northeast to avoid the historic community of Prospect, actively cultivated farms and WIA's in Beckwith Township. The route continues into Goulbourn Township and avoids a concentration of buildings in lots 2, 3 and 4 in Concession 6.

Just west of the Jock River, in Lot 3, Concession 7, Goulbourn Township, the route angles east passing through the mid-concession. The route turns southwest to avoid the river and farms on the south side of County Road 12.

The route then angles slightly north until Lot 12, to avoid buildings in the southern part of lots 11 and 12 of Concession 7. The route continues mid-concession until Lot 21, Concession 7 where the route turns north to avoid the good agricultural land east of County Road 5 in concessions 6, 7 and 8.

At the intersection of county roads 5 and 12, there are a number of identified constraints. There is a large active pit on the northwest corner with an inactive pit and several buildings located on the southwest corner. There is a pine plantation and a CBC Shortwave Radio Monitoring facility on the northeast corner, and a go-kart track on the southeast corner. The active pit and plantation would be affected marginally.

In Lot 25, Concession 9, of Goulbourn Township, the route turns northeast to pass mid-concession to the edge of the township and would minimize effects on agriculture. At the Goulbourn/Kanata line, the route turns slightly north to join the existing right of way.

As with the Blue Route, this route utilizes the existing right of way through the Stony Swamp to point Y.

- Sub-Alternative $\text{KNOO}_1\text{P}_1\text{RY}$

There is a sub-route alternative for the Red Route through Goulbourn Township. Instead of turning northeast at point K, the route continues in Concession 4, until Lot 25 and avoids crossing the Prospect Marsh. In Lot 25, the route turns southeast, crossing County Road 4, and passes through the middle of the third concession in Goulbourn Township to minimize effects on agriculture and avoid existing buildings.

- Sub-Alternative KNOO_1Y

The section from point O to Y is described under the Green Route.

F.3 Green Route (ABEGLMOO_1P_1RY)

From Point A to E this route is the same as the Blue and the Red Routes.

From Point E, consideration was given to avoiding residences along County Road 8, near Glendower, a small lake, a large forested wildlife complex associated with three WIA's, high quality hardwoods, a licensed pit, and pockets of agricultural land. These features are located in lots 6, 7 and 8, in Concession 1, in Bedford and Hinchinbrooke townships.

The route passes in an easterly direction until Lot 9, Concession 1, in Bedford Township, where it turns to the northeast to avoid residences along County Road 8. The route is drawn in the northern half of the corridor to avoid the development along the road. The route also avoids a licensed pit on County Road 8 and utilized the farm field/forest interface to minimize potential effects on the adjacent farm. The route follows a small valley to avoid cresting and to avoid the viewshed of Potspoon Lake. Although some high quality hardwoods would be affected, a more northerly alignment would affect more forest area, in total, and would cross a licensed pit.

A route alignment south of Potspoon Lake was not identified because it would increase the route length, and would potentially affect osprey nesting, and waterfowl breeding areas. South of the lake, the route would also cross more forested land, potentially affecting high quality hardwood stands and an area of deer concentration.

The route continues northeast through Bedford Township crossing an existing Hydro right of way and County Road 8. The route avoids the concentrations of buildings along County Road 8, and farm land to the north and west of the road.

Options east and west of the hamlet of Burridge were considered. An alignment west of Burridge is preferred because it crosses less agricultural land, and fewer hardwood and maple sugar bush stands than a route to the east. There are a number of farms scattered in the Barrs Creek Valley, which has steep slopes and some prominent crests. The combination of these potential problems outweigh the potential change to the appearance of the landscape within the viewshed of Burridge Lake.

The route makes a series of minor turns to avoid the north end of Wolfe Lake, reduce the angles and pass between a stand of hardwoods on the north side of Green Lake and a wetland.

The route turns east to avoid a large hardwood stand in lots 31 and 32, homes along County Road 36, and a heronry to the south in Lot 22, Concession 8, in North Crosby Township. The route crosses a large treed wetland but avoids a deer concentration area in lots 24, 25 and 26, concessions 7 and 8.

Just east of County Road 36, the route turns east to avoid a large wetland in lots 23 and 24, and homes along County Road 10 (Perth Road).

The route turns north in Lot 18, Concession 2, in North Burgess Township, to minimize intrusion on the viewsheds of Black and Pike lakes. Continuing through the middle of the seventh concession, the route avoids a large stand of hardwoods (lots 23 and 24, Concession 7) and crosses only the edges of several wetlands.

South of Stanleyville, the route turns northeast to avoid the east end of Black Lake and to minimize visual intrusion on residents in Stanleyville. The alignment avoids a number of farm dwellings and utilizes the farm field/forest interface to minimize effects on both resources. There are a number of WIA plantations and a large wetland which, for the most part, are avoided.

In Lot 9, Concession 9, the route turns eastward to proceed mid-concession to the edge of North Burgess and North Elmsley townships. This route location avoids all buildings, crosses a wetland (lots 2, 3 and 4) at its narrowest point, avoids hardwood stands in the south half of lots 3, 4 and 5, and a WIA in the north half of Lot 6. The route is aligned to minimize effects on agriculture but crosses a large area of high industrial mineral potential (lots 1 through 14, Concession 9).

The route enters North Elmsley Township in Concession 9, but turns northeast in Lot 30 to avoid the concentration of houses along County Road 1 (Rideau Ferry Road) and to locate the towers north of the Perth Wildlife Reserve Interpretive Centre.

In Lot 26, Concession 9, the route turns eastward to avoid the Perth sewage lagoon and cross the Tay River at right angles to minimize the visibility of the lines from the river.

After crossing the Tay River, the route turns east to Montague Township.

This route alignment (GL1) through North Elmsley Township is a sub-link alternative to the original alignment which is located farther south to avoid the Rideau Valley Conservation Authority lands in the Tay Marsh. The initial alternative route continues straight through the centre of Concession 9, to Lot 28. At this point, the alternative route turns southeast to avoid the residential development on County Road 1. This avoids an area of waterfowl habitat associated with Jebbs Creek but is within the viewshed of the east end of Otty Lake. The alternative continues southeast, crossing over County Road 1 and passing over the western edges of the Tay Marsh.

In Lot 27, Concession 7, the alternative route turns east to cross the Tay Canal (which is part of the Rideau Canal System). There are two sets of locks on the historic Tay Canal and the alternative is about 500 m north of the upper lock station.

The Highway 43 crossing avoids homes and farm buildings. East of the highway, the route roughly parallels the township fabric to minimize diagonal severances and associated effects on agricultural land uses and avoid two hardwood stands.

The alternative route angles north to rejoin the route described previously. The location of the route through the east half of North Elmsley Township was influenced by the Department of National Defense (DND) communication tower field. The DND property spans Concession 10 occupying the east half of Lot 17, all Lot 16, and the west half of Lot 15.

The route alignment through the ninth concession of Montague Township avoids the concentration of farms and residences in Lots 23, 24, 25 and 26. All buildings are avoided but large wetlands which spanned the concession in lots 29 and 30, is not avoided. The route would minimize the effect of crossing of a treed wetland in lots 26 and 27, and avoid a plantation in the south half of Lot 25, and a hardwood stand in the north half of lots 23 and 24.

In Lot 17, the route turns east to continue mid-concession through the ninth concession of Montagne Township. The alignment minimizes crossings of the wet areas throughout the concession. The route utilizes the farm field/forest interface to minimize effects on both resources, and avoid all buildings, and a hardwood stand in the north half of lots 10 and 11.

The route continues into the eighth concession of Rideau Township where, in Lot 26, it joins the existing 115 kV transmission right of way. The existing line would be removed from this point to Richmond DS.

The route utilizes the exiting right of way through the remainder of Rideau Township and into Goulbourn Township. In Lot 17, Concession 4, just north of County Road 10, the existing line turns east towards Richmond but the route continues northward through a wetland. This alignment utilizes the treed areas to avoid the farm land to the east and west of the route. The route continues north, over the intersection of county roads 5 and 12, into the ninth concession, as described for the Red Route.

- Sub-Alternative (OY)

The first alternative follows the existing 115 kV line on the west side past Richmond and through the Stony Swamp until Point Y on the Agriculture Canada Experimental Farm in the City of Nepean. The existing line would be removed, as far north as Richmond DS (Lot 25, Concession 4, Goulbourn Township). The west side was chosen because it avoids encroachment on farm buildings in Lot 26, Concession 5, Goulbourn Township, and on a feed mill at County Road 12, it avoids crossing Cedar Hill Estates development, in Lot 24, Concession 4, and avoids encroachment on National Capital Commission administrative buildings in Lot 26, Concession 4, Nepean. Commercial buildings on County Road 11 and farm buildings on County Road 10 abut the existing right of way on both sides, providing no significant difference east or west of the 115 kV line.

- Sub-Alternative (MNPP$_1$RY)

From Point M, this alternative follows the existing right of way for a shorter distance, and turns north from the 115 kV line in Lot 13, Concession 2, Goulbourn Township. This alternative proceeds north and avoids the large wetland to the east, the historic community of Stapleton, a moto-cross track in Lot 15, Concession 5 and a concentration of farms in lots 15 and 16, in concessions 6 and 7. This alignment would minimize the effect on sand and gravel reserves.

F.4 Yellow Route (ABCDILMO$_1$P$_1$RY)

The Yellow Route alternative continues through Kingston Township, on Ontario Hydro property, between the two existing transmission lines. At point B, the route turns east to avoid a forested wetland and a residence at the southern edge of the wetland, and to minimize the amount of farm land crossed. Alternative locations for this turn were ruled out because continuing northward past Cataraqui TS would have resulted in encroachment on an adjacent farm, skylining on a major crest, and placement of large turning towers on farm land already affected by existing transmission towers. The route passes through the first concession of Loughborough Township. A more northerly alignment would have resulted in a route that crosses more farm land and a heronry, and is nearer to the historic settlement of Railton.

The route crosses the south end of Concession 1, in Loughborough Township, until Lot 5.

The route swings to the northeast in Lot 5 to avoid the residential development along County Road 9, a licensed pit, and crossing a major crest at the south end of Loughborough Lake, which has recreational and estate type development along its eastern shore. A Woodlot Improvement Agreement forest stand was crossed in the north of Lot 6, Concession 1, to minimize forest removal.

Just east of County Road 9, the route turns east on rocky, forested land. It then crosses agricultural and forested lands until Lot 9, Concession 2, where the route turns northeast to parallel Loughborough Lake. This alignment was chosen because it avoids residences on County Road 9, the hamlet of Railton and residential concentrations on the first and second concession roads. The crossing of the third concession avoids a subdivision in lot 10, and one in Lots 11 and 12, all in Concession 3. There are a number of farm buildings between these subdivisions that are also avoided. The route passes west of these buildings and avoids crossing the heart of a waterfowl breeding area and heronry on Loughborough Lake.

Route alignments in the northeastern portion of the corridor, in concessions 3, 4 and 5, were not considered because of the residential strip development on the concession roads, the diagonal crossing of a large tract of high quality farm land, the proximity to Spaffordton and the high degree of visibility to the residents of Railton and Spaffordton.

The route is located in an area of lower relief through Concession 4, between the community of Spaffordton and Loughborough Lake. This reduced the potential visibility of the towers from the lake and from Spaffordton. Although the route crosss agricultural land in this area, there are untillable areas in the fields where towers can be located to minimize effects upon farm operations.

In Lot 16, Concession 5, the route swings slightly east to reduce the amount of agricultural land crossed and to utilize a long rocky, forested ridge. Although the alignment along this ridge, would be visible from Loughborough Lake, it provides a relatively straight route across sparsely forested bedrock which has already undergone some clearing. The route continues diagonally through Concession 5, avoiding farms and residences at the crossing of County Road 10 (the Perth Road) at Missouri.

East of the Perth Road, the route turns northeast in Lot 19, Concession 5, and proceeds diagonally through the sixth and seventh concessions into an area of the Canadian Shield that has little road access. The route passes west of Lacey Lake in the seventh concession of Loughborough Township and turns east of Pond Hole Lake. This alignment avoids large wetlands adjacent to Loughborough Lake and reduces the length of line within the viewshed of cottagers and others using Loughborough Lake. The route also avoids a large wetland in Concession 8, in Loughborough Township, provides an optimal crossing of a pocket of farm land while avoiding the farm buildings, and avoids a high quality hardwood stand in Concession 11, in Storrington Township. Hewlett-Packard (Canada) Limited owns six lots in concessions 11 and 12, in Storrington Township, which it is developing as an employee recreational retreat. The route crosses the property through lots 1 and 2, Concession 11. However, care was taken to align the route to avoid the viewsheds of Elbow and Spectacle Lakes, which are the focus of the proposed recreational developments.

In Lot 6, Concession 11, the route turned north to avoid Fishing Lake, Loughborough Lake and Lower Rock Lake. The route also avoids a high quality hardwood stand and a large deer concentration area.

East of Lower Rock Lake, in Lot 16, Concession 13, the route turns east to parallel the thirteenth concession line, until Lot 30. Through this area of Storrington Township, the route avoids long wetland crossings, small water bodies and high quality hardwood stands containing sensitive flora.

The route turns slightly north in Lot 30, Concession 13, to avoid a farm and farm buildings just west of Mud Lake. The route crosses into South Crosby Township and in Lot 6, Concession 9, it joins the existing 115 kV right of way.

The route parallels the west side of the existing line to Jones Falls; about 4.5 km away. The west side was chosen because it would minimize the effect on cottages at Jones Falls and avoid encroachment on farm buildings in Lot 9, Concession 3, and Lot 10, Concession 2, in South Crosby Township.

The route continues parallel to the west side of the existing right of way through South Crosby, Bastard and Kitley townships where the area is relatively homogeneous, having pockets of farm land, quality woodlots and wetlands distributed on both sides of the right of way.

The Otterdale Mobile Home Park is located in South Elmsley Township, Lot 5, Concession 2. Also, there is concentrated residential strip development along Highway 29. Both these developments are adjacent to the existing right of way. The route traverses a wetland area associated with Otter Creek. The proximity to homes and the difficulty of building towers in the wetland resulted in a diversion of the route to the east, starting in Lot 9, Concession 1. The diversion ran mid-concession to Lot 5, Concession 1, crossing Highway 29, where it turns north to skirt part of the Otter Creek wetland, utilizing the farm land/woodlot interface. The diversion rejoins the existing line in Lot 4, Concession 2, in South Elmsley Township.

The route continues to parallel the west side of the 115 kV line to Smiths Falls TS. From this station, through the remainder of South Elmsley Township and through Montague, Rideau and Goulbourn townships, the existing line would be removed and the existing right of way would be expanded on either side to minimize effects on adjacent land uses.

From this point, the route is the same as described for the Green Route.

F.5 Brown Route

The Brown Route follows the existing Ontario Hydro-owned right of way until point A, in Kingston Township. The route turns east to run roughly mid-concession to County Road 9. This alignment avoids concentrations of residences on County Road 3 adjacent to the existing right of way and at Glenvale. The route minimizes the length of active agricultural land crossed, avoids a house and a commercial building at Highway 38, utilizes edges of woodlots, avoids a Woodlot Improvement Agreement forest (WIA) adjacent to Highway 38 in Lot 1, avoids a wetland in Lot 5, and crosses the Rideau Foot Trail in open farm land where changes to the landscape would be minimal.

East of County Road 9, the route turns northward to avoid residential strip development in Lot 20, and to minimize the effects on a WIA in Lot 21, while avoiding buildings north and south of the route, in the same vicinity. The Glen Haven Cemetery north of Shannons Corners, residential strip development on County Road 10 (Perth Road), and a WIA in lots 25 E 1/2 and 26 W 1/2, all influenced the location of the crossing of Collins Creek, which is a wetland with waterfowl and furbearer habitat. This location also minimized the length of the right of way that would be within the wetland.

In Lot 32, still in Concession 6, in Kingston Township (just west of Mount Chesney), the route turns northeast. The diagonal alignment is oriented to avoid the strip residential development along County Road 11 (Battersea Route) and a maple sugar bush west of Mount Chesney.

In Storrington Township, the route angles slightly east to utilize a field/woodlot edge until it joins the existing 115 kV right of way in Lot 40. The route turns to parallel the existing line. If the route had joined the existing right of way farther south, it would have encroached on residences along the Battersea Road. The route is set back from Collins Lake to avoid a waterfowl breeding area and sensitive flora located on the east shore of the lake, to minimize effects on the viewshed of Collins Lake, and to avoid licensed pits in lots 36 and 37. The density of the residential development along the Battersea Road, between the existing right of way and Sunbury, also blocked a more northerly route through this area.

The existing 115 kV line was paralleled on the west side to avoid as many homes as possible at the Battersea Route, to avoid a long crossing of a wetland east of Horseshoe Lake, to avoid encroachment on the shorelines of Traverse and Mud lakes, and to skirt an area of high aggregate reserve potential.

From this point (D), this route is the same as described for the Yellow Route.

F.6 Orange Route (ABEGHILMOPRY)

This route was the same as the Blue, Red and Green Routes to point G.

In Lot 16, Concession 5, in Bedford Township, the route joins an existing right of way and turns east. The route parallels the existing lines on the south side through Bedford Township and into North Crosby Township. There are no land use or environmental advantages through this area that would result in the north side or south side being preferred. There are, however, a number of constraints farther east, particularly at Newboro and Portland, that precluded the widening of the right of way to the north.

The existing transmission lines enters North Crosby Township in Lot 9, Concession 10 and proceeds diagonally across the township to the Newboro area. In the Newboro/Portland area, Ontario Hydro considered four different scenarios: parallel with two lines on the south side of the existing right of way; parallel with two lines on the north side of the existing right of way; parallel with one line north and one line south of the existing right of way; and parallel with one line on the south side and consolidate the other 500 kV circuit with the existing 230 kV circuit on the north half of the existing right of way.

The latter alternative was chosen, primarily to reduce the right of way width through this area and keep to a minimum the number of new towers required. There is development adjacent to the right of way at Highway 15, including a cemetery, a school and a number of homes which would be affected. There is a large horse farm just south of the lines which would be affected by having both new lines to the south and the new lines would be very close to a number of buildings in Newboro. Consolidation would reduce the number of new towers affecting farm operations, reduce the visual effects by minimizing the number of towers and minimizing the amount of forest cutting.

Between Newboro and Portland, the route crosses the northeast corner of South Crosby Township and the northern half of Bastard Township. The route continues east until Lot 10, Concession 4, in Bastard Township, where it turns northeast to follow the existing right of way.

From this point (I), this route is the same as described for the Yellow Route.

F.7 Purple Route (ABCHILMO$_1$P$_1$RY)

This description only covers link CH. The remainder of the route is described under the Yellow and Orange Routes.

At point C, the route turns north, passing west of Pond Hole Lake. This alignment was identified because it avoids the large wetlands and a pocket of farm land to the east, and avoids a concentration of residences in the ninth concession of Loughborough Township to the west.

A slight shift east was required south of Rock Lake Road (Lot 25, Concession 10) to align the facilities between Hinge and Stonehouse lakes (Lot 4, Concession 14, Storrington Township). The Rock Lake Road crossing avoids high quality hardwoods in lots 23 and 24, Concession 10, in Loughborough Township, a licensed pit on the Loughborough/Storrington township line adjacent to the road, and the Hewlett-Packard (Canada) Ltd. recreational property in Concession 12, in Storrington Township. The Rock Lake Road is also part of the Rideau Foot Trail. Crossing adjacent to the pit would concentrate the less visually appealing features in one area.

The alignment between Hinge Lake and Stonehouse Lake avoids a karst formation between the Canadian National Railway and Stonehouse Lake, and a licensed pit in Lot 3 and Lot 4, Concession 13, in Storrington Township. The route is located close to the south end of Hinge Lake to minimize the effects on a high quality hardwood stand in lots 5 and 6, Concession 14.

The route avoids a number of wetlands and lakes but crossed the Rideau Foot Trail twice in lots 1 and 2, Concession 14, in Bedford Township. The crossings of the foot trail was necessary to avoid affecting three heronries, a wetland, and the cottage development on Buck Lake.

In Lot 3, Concession 14, in Bedford Township, the route turns northward to proceed straight through the Bedford Mills area. The route crosses the Rideau Trail in Lot 4, Concession 14, and then three more times within about 1 km at the Bedford/North Crosby township line. The combination of rugged terrain and lakes around Bedford Mills and houses at Bedford Mills itself make crossing this area very difficult. The alignment chosen avoids all buildings and minimizes the water crossings. The route crosses the historic Perth Road (County Road 10) diagonally just north of the bridge at Bedford Mills, and a heronry at the west end of Loon Lake.

In Lot 4, Concession 9, in North Crosby Township, the route turns east to cross concessions 7 and 8. The route avoids homes along the eighth concession and the Perth Road (County Road 10). A wetland in lots 3 and 4, Concession 8, is crossed to avoid the residences on the concession road. In Concession 7, the route follows a farm field/woodlot edge to minimize forest clearing and effects on farm operations.

In the east half of Lot 4, Concession 7, the route joins the existing right of way, following the Orange Route.

F.8 Refinement of Alternative Routes

Alternative routes were delineated on the 1:15,000 scale photo mosaic maps in the summer of 1983. A series of Municipal Participation Centres were held in Eastern Ontario in November of 1983. At these MPCs additional information was provided by the public. In a number of cases, site visits were made to individual properties along the routes to discuss proposals with the directly affected owners. As a result of this input, refinements were made to the routes in seventeen locations as shown in Figure F. The routes were then evaluated, compared and a recommended route selected.

The refinement locations are listed below:

1. The right of way was shifted south to rocky land in Lot 6, Concession 6, Kingston Township. Preserves more screening between the line and house in Lot 6, Concession 6, Kingston Township.

2. The right of way was moved south at Collins Creek to improve the creek crossings and avoid a new house on Perth Road.

3. The intersection point between the new right of way and the existing 115 kV right of way, was moved north to keep as many towers as possible off farm land.

4. The right of way was moved north slightly to be further away from existing and proposed buildings in Concession 1, Loughborough Township.

5. The right of way was moved away from a new building lot on Perth Road and also further north of Lacey Lake.

6. The right of way was realigned through Storrington Township to avoid placing angle towers in wetlands.

7. The right of way was shifted to the west of the existing 115 kV line at Bob's Lake to minimize the visual impact.

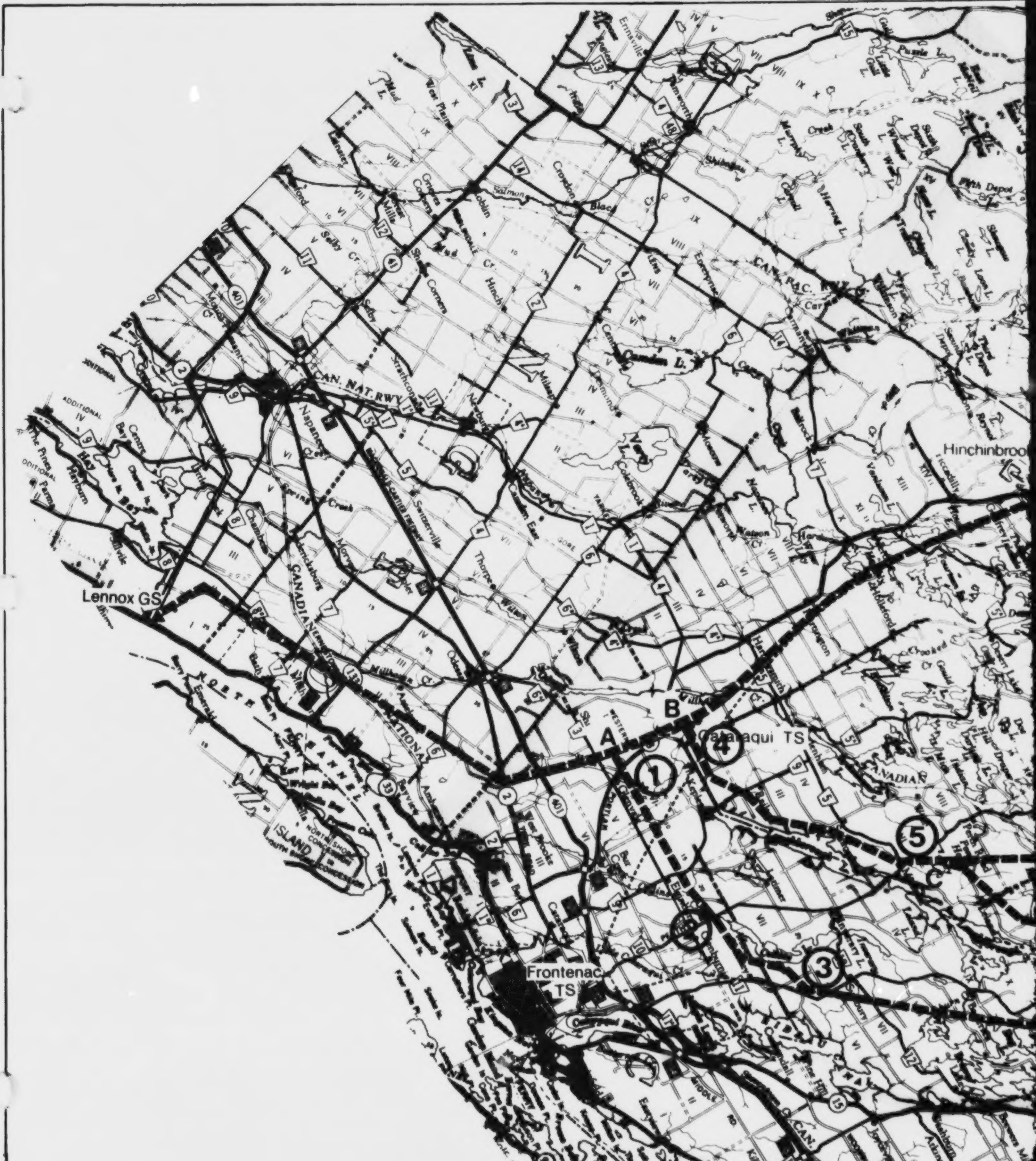
8. The angle in Concession 8, Township of North Crosby was moved north to avoid a residence and minimize the diagonal severance.

9. The right of way was shifted east at County Road 8 to provide a screen of trees between the line and existing buildings.

10. The right of way was moved to the east thereby lessening the visual impact of the line from the church and community hall which is located south of Burridge.

11. The right of way was straightened to minimize the impact on farm operations and keep the line out of viewshed of Otty and Black lakes.

12. The right of way was realigned east of the Tay River to better follow the lot lines.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Hay Bay
ISLAND
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SOUTH SHORE CONCESSION
Millhaven Cr.
Wilton
Crooked Cr.
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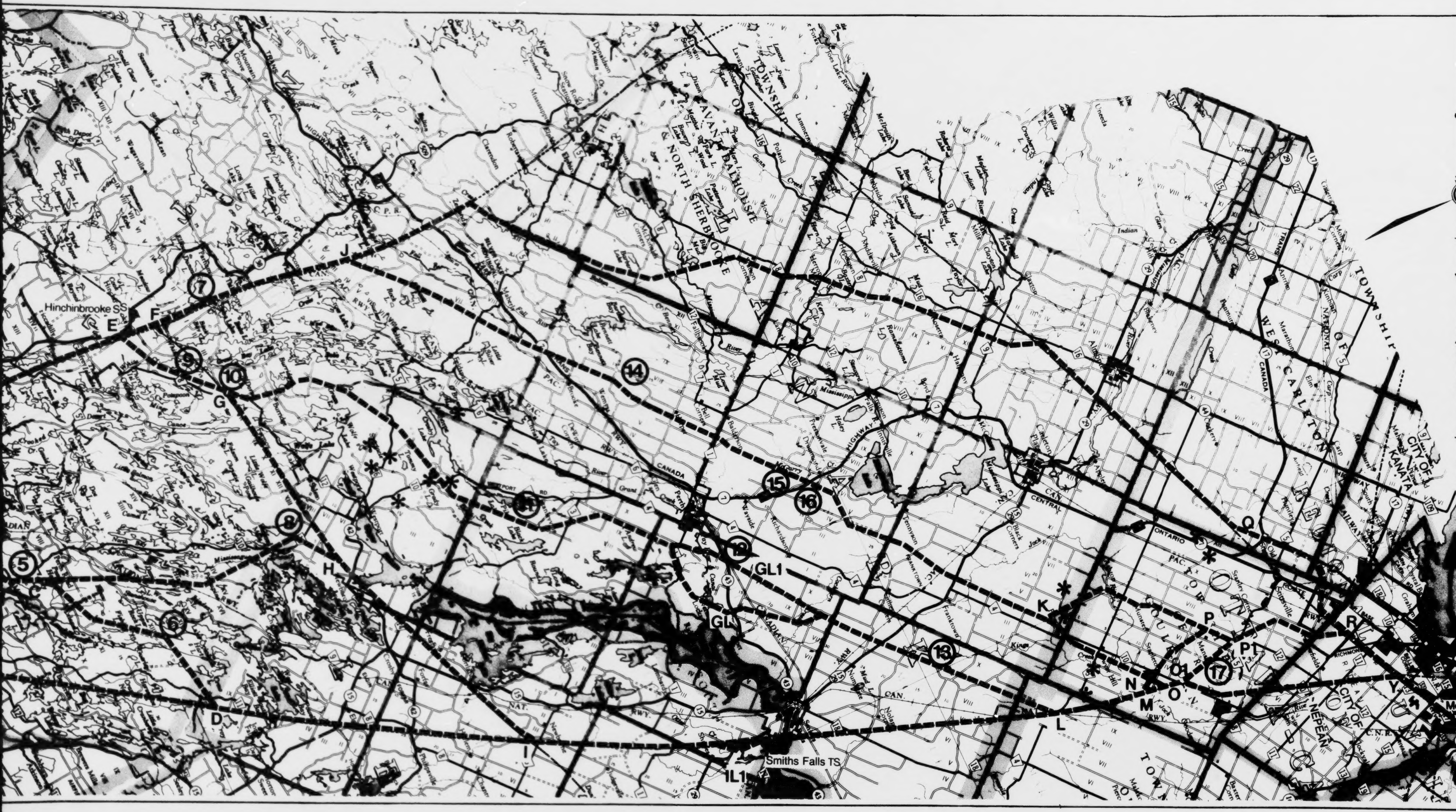
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CAN. NAT. RWY.
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Mississippi
Perth
Carleton Place
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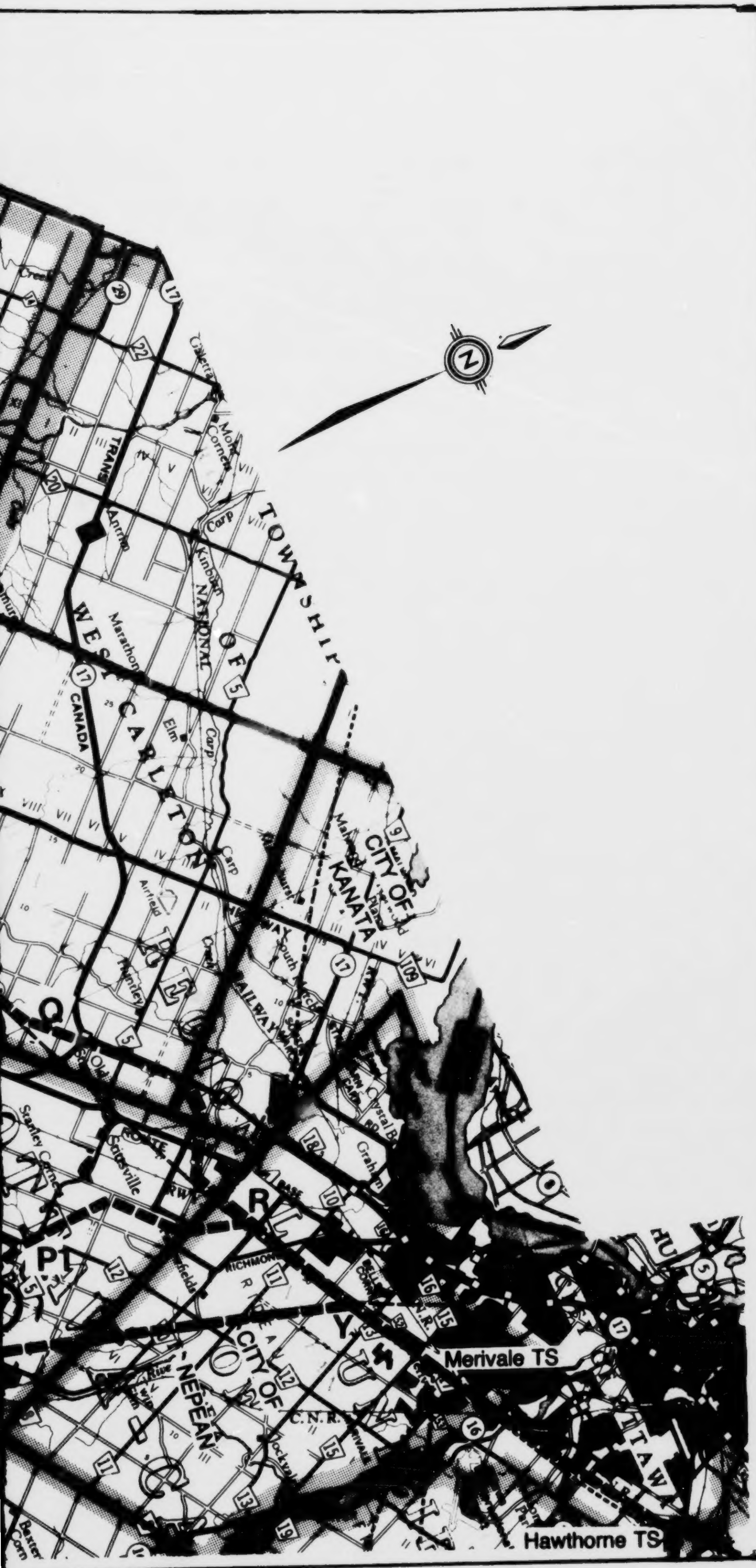
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Elm
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Appendix F
Refinement of Alternative Routes

Legend

━━━	Existing 500 kV line
—— ——	Existing 230 kV Lines
------------	Existing 115 kV Line
■	Transformer or Switching Station
▬▬▬▬	Alternative Routes
A	Route Intersection
*	Alternative Telecommunication Sites

Note: Route & site alternatives may be changed as a result of further input from the public

Alternative routes and sites are not drawn to scale

Scale 1 250,000

5 0 5 Miles

5 0 5 Kilometres

Eastern Ontario Study – West Section

13. The angle in Montague Township was removed to reduce costs.

14. The right of way was shifted slightly in Concession 7, Bathurst Township, to reduce the angle and stay out of the woodlot.

15. The right of way was realigned south through the Blueberry Marsh to minimize the impact on the farms to the north. The use of the unopened road allowance minimized new severances and keeps the line further away from the municipal dump south of Drummond Centre.

16. The right of way was realigned in Concession 6 east of Highway No. 7 to reduce the impact on tile drained agricultural fields.

17. A new sublink was located in Concession 4, 5, 6 of Township of Goulbourn to make use of a wet area north of Richmond.

Volume

3

EASTERN ONTARIO TRANSMISSION LINE STUDY

ROUTE STAGE - VOLUME III

Hawthorne Transformer Station to

St. Lawrence Transformer Station

Environmental Assessment

March, 1985
Report No. 85026

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SUMMARY

Volume III describes the land use, environmental, socio-economic, cost and technical studies and the public involvement programme carried out by Ontario Hydro to select the recommended route for one 500 kilovolt (kV), single circuit (1 cct) transmission line from St. Lawrence TS, in Cornwall, to Hawthorne TS, in Ottawa. Also, Volume III describes similar studies carried out to select recommended sites for associated telecommunications facilities.

The recommended route, shown on Figure 1.1, follows the south side of the Canadian National Railway (CN) line from Hawthorne Transformer Station (TS). West of the Village of Carlsbad Springs the route leaves the parallel of the railway line and follows property fabric south through the City of Gloucester and the Township of Osgoode until it reaches an existing 115 kV transmission line right of way. The proposed 500 kV transmission line will be built to replace the existing 115 kV transmission line through Russell, Winchester, Finch, Osnabruck and Cornwall Townships over a distance of 39.1 km.

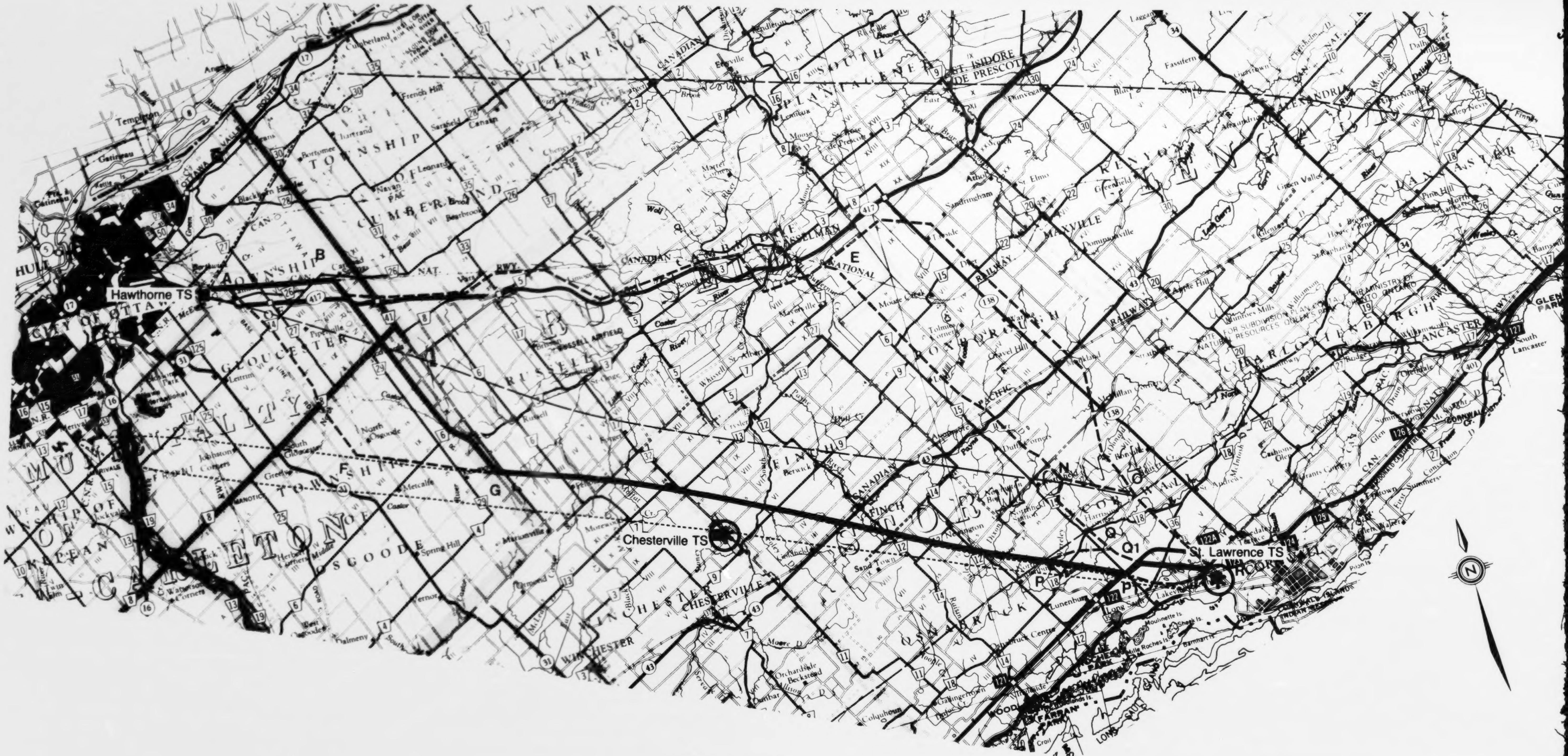
In Cornwall Township, from a point on the existing 115 kV transmission line north of County Road 18 the recommended route follows the northerly side of the existing transmission line until it crosses Highway 401. The route follows the south side of Highway 401 for a short distance to an existing 230 kV transmission line located on property owned by Ontario Hydro. The recommended route follows the south side of this existing transmission line to St. Lawrence TS, in the City of Cornwall. The total length of the recommended route is approximately 78.1 km.

The major reasons for selection of the recommended route, over the other major alternative, are as follows:

- least cost and most direct route;
- least overall effect on active agricultural land;
- least effect on forest resources;
- least effect on biological resources;
- least visual effects;
- least effect on heritage resources;
- least effect on areas of aggregate potential;
- least effect on existing and proposed residential areas;
- low socio-economic effects;
- right of way requirements are reduced and existing severances are used; and
- the route adheres closely to suggestions provided by the public.

It is proposed that the 500 kV transmission line be built using conventional four footing lattice towers in all areas except in class 1 to 4 active agricultural land. In open cultivated fields of prime farm land where technically feasible, narrow base lattice towers will be used for suspension towers. All angle towers will be conventional four footing lattice towers.

The recommended sites for two new microwave radio stations, shown on Figure 1.1, are within existing Ontario Hydro owned transformer station sites at Chesterville TS and St. Lawrence TS. These locations were chosen because of technical advantages or requirements and low potential for environmental effects.



Hawthorne TS
Chesterville TS
St. Lawrence TS
A
B
E
F
G
P
Q
Q1
N
CITY OF OTTAWA
HULL
TOWNSHIP OF CUMBERLAND
GLOUCESTER
OSGOODE
RUSSELL
FINCH
CHESTERVILLE
WINCHESTER
MAXVILLE
CASSELMAN
ST. ISIDORE DE PRESCOTT
LANCASTER
CORNWALL

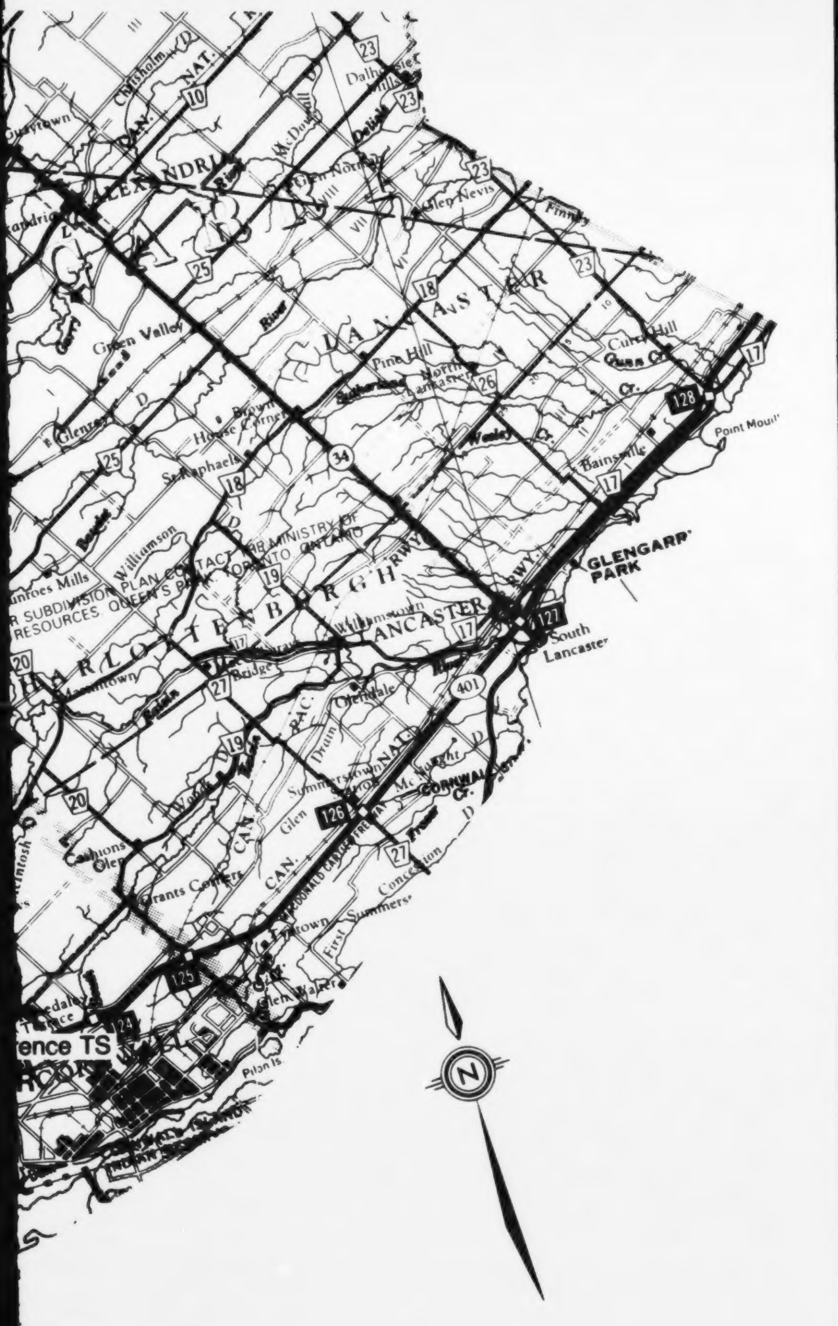

ALEXANDRIA
Green Valley
LANCASTER
Pine Hill
North Lancaster
Bainsville
Point Mouillee
GLENGARRY PARK
South Lancaster
Williamstown
Martintown
Summerstown
Glen Walter
Grants Corners
ence TS
CORNWALL
N
17
23
25
34
128
127
126
125
401

Figure 1.1
Recommended Route and Sites

Legend

— —	Existing 230 kV Line
---------	Existing 115 kV Line
■	Transformer Station TS
– – – –	Alternative Routes
A	Route Intersection
━━━	Recommended Route
⊛	Recommended Telecommunication Site

Note: Alternative routes and sites are not drawn to scale
All boundaries are approximate.

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Ontario Hydro
Design and Development Division
–Transmission

Drawn by K. Kolyn	Supervising Planner Mario Bszyk
Date March 1985	Supervising Project Engineer
Work Order 840 03016	Graphics Prod. Supervisor D. Henderson

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1.0 INTRODUCTION

The Environmental Assessment (EA) Report for the Route Stage has been prepared in three volumes.

Volume I - covers those aspects of the study which are common to both the proposed transmission lines and telecommunications facilities between Lennox Generating Station (GS) and Hawthorne Transformer Station (TS), and the transmission line and telecommunications facilities between Hawthorne TS and St. Lawrence TS. These include a description of the undertaking, an update of the need for the proposed facilities and a discussion of the alternatives.

Volume II - describes the study to select the recommended route for two, 1 circuit 500 kilovolt (kV) lines from Lennox GS to Hawthorne TS and sites for associated telecommunications facilities (West Section).

Volume III - describes the study to select the recommended route for a 1 circuit 500 kV line from Hawthorne TS to St. Lawrence TS and sites for associated telecommunications facilities (East Section).

This volume (Volume III) of the EA describes the study which resulted in the selection of the recommended route and sites for the East Section. The study was initiated in the fall of 1982 and was carried out in four steps. Public involvement was a component of each step. The steps included:

- introduction of the study and data collection,
- location of alternative corridors and a study area for locating one of the two telecommunications sites,
- location of alternative routes and sites and,
- selection of the recommended route and sites.

In making the selection of the recommended route and sites, pertinent aspects of the environment, as well as technical, cost factors and public comments were considered. The selection of the recommended transmission line route, and the selection of the recommended sites for telecommunications facilities are documented separately in this volume. The transmission line study begins at Section 2.0 and the telecommunication facilities study begins at Section 9.0.

2.0 STUDY PROCESS: TRANSMISSION

2.1 Overview

The East Section Route Stage study was undertaken by Ontario Hydro to select a recommended route for a one circuit 500 kV transmission line from Ottawa to Cornwall. The study process followed four steps to reduce the study area approved following the Plan Stage hearings to a recommended route.

The study process integrated those aspects of the natural and social environment which could be affected by transmission facilities, with the technical and cost considerations. At each step in the process, more detailed information was used to eliminate part of the study area from further consideration. Reviews and comments were solicited from all levels of government, interest groups, property owners and the public as the study progressed from refinement of the Plan Stage study area to the selection of the recommended route.

The following were the four steps in the study process (Figure 2.1):

(1) Introduction of the Study and Collection of Data

- At the start of the study, Ontario Hydro prepared an inventory of environmental resources within the study area at a scale of 1:50,000. This information was used to identify thirty environmental situations under nine factor categories. Objective statements outlining the reasons to avoid these environmental situations were then defined. The environmental situations and corresponding objective statements were used to prepare factor maps. Based on this information, environmental constraint levels were developed. These constraint levels were used by Ontario Hydro to prepare a constraint map. An environmental suitability and an environmental diversity map were also produced.

- Concurrent with the data collection, the study was introduced and community contacts were carried out. A Regional Committee was formed to assist Ontario Hydro in assessing the importance of environmental resources in the study area.

- Regional socio-economic data were collected.

(2) Location of Alternative Corridors

- Guidelines were developed for locating alternative corridors.

- Alternative corridors were identified by Ontario Hydro and reviewed by the Regional Committee, public and government representatives.

(3) Location of Alternative Routes Within Corridors

- Detailed data were collected within and adjacent to the alternative corridors, and mapped at a scale of 1:15,000.

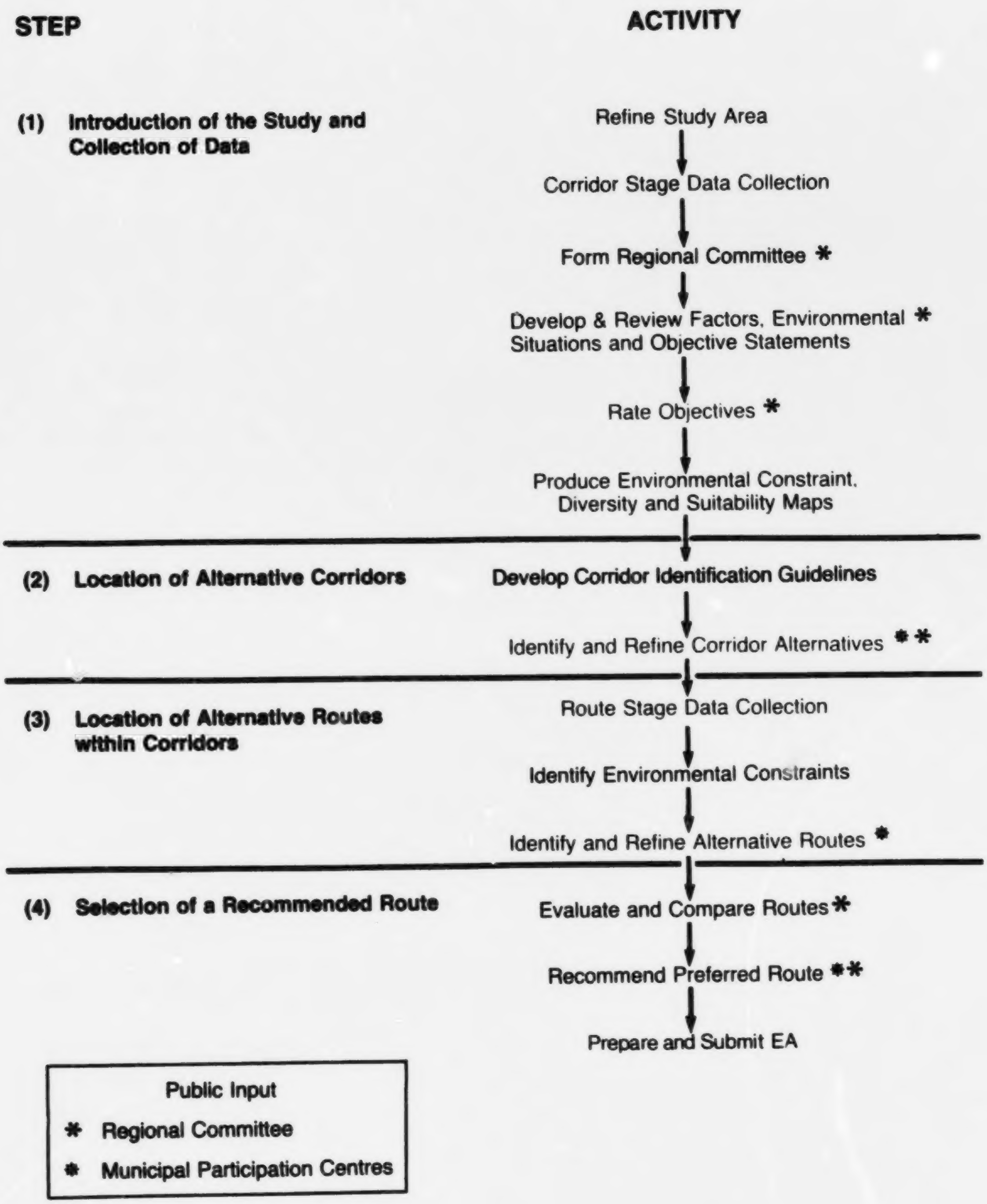

STEP
ACTIVITY
(1) Introduction of the Study and Collection of Data
Refine Study Area
Corridor Stage Data Collection
Form Regional Committee ✱
Develop & Review Factors, Environmental Situations and Objective Statements ✱
Rate Objectives ✱
Produce Environmental Constraint, Diversity and Suitability Maps
(2) Location of Alternative Corridors
Develop Corridor Identification Guidelines
Identify and Refine Corridor Alternatives ✸✱
(3) Location of Alternative Routes within Corridors
Route Stage Data Collection
Identify Environmental Constraints
Identify and Refine Alternative Routes ✸
(4) Selection of a Recommended Route
Evaluate and Compare Routes ✱
Recommend Preferred Route ✸✱
Prepare and Submit EA
Public Input
✱ Regional Committee
✸ Municipal Participation Centres

Figure 2.1
Route Selection Process

- Alternative routes were identified that best avoided constraint areas, met technical criteria, and considered public comments.

- Alternative routes were reviewed by the Regional Committee, the public, and government representatives.

(4) Selection of a Recommended Route

- Evaluations of the alternative routes were carried out based on environmental, socio-economic, cost, and technical considerations, and public comments. The alternatives were then compared and a recommended route selected.

- The recommended route and the alternatives will be reviewed with the Regional Committee, the public and government representatives.

2.2 Public Involvement Programme

2.2.1 Purpose

The purpose of the public involvement programme was: to ensure that those persons potentially affected by, or interested in, the study received information; and had the opportunity to participate and offer comments throughout the Route Stage study.

Two objectives were developed for the public involvement programme during the introduction of the study, step one. First, to introduce the Route Stage study to the public, information on the study background, future activities, and project schedule was provided. Second, information was obtained from the Regional Committee on the relative importance of land use and environmental resources within the study area.

During step two, when the corridors were being identified, the objective was to give local residents the opportunity to review the alternative corridors and to provide local knowledge. This assisted Ontario Hydro in refining the corridors and in identifying alternative routes.

At the third step, once alternative routes were located, the public was encouraged to review the alternative routes. Potentially affected property owners were invited to review the alternative routes and provide Ontario Hydro with information on their properties to assist in evaluating these alternatives.

Following the selection of a recommended route, step four, the objective will be to inform the potentially affected property owners and the public of the recommended route and the reasons for its selection. Ontario Hydro will outline the subsequent approval process and post approval activities to them and document public comments on the recommendation.

2.2.2 Programme Design

The public involvement programme was designed to focus on two components: information and involvement. To ensure that information about the study was available to the public, a number of different methods were employed. These methods are described below.

- A mailing list containing names of interested individuals, groups, organizations, and potentially affected property owners was developed.

This list was updated as the study progressed and correspondence and information materials were mailed out at key stages to all persons on the list.

- Information displays were set up at Ontario Hydro area offices in Winchester, Vankleek Hill, Ottawa and the R.H. Saunders Energy Information Centre in Cornwall.

- Print and electronic news media were contacted at each step and press releases were issued to provide information for articles and reports on the study progress.

- Advertisements placed in daily and weekly newspapers were used to provide notification of opportunities for public review of the study.

- Speaking engagements and meetings with municipalities, interest groups, and individual property owners were held as requested to provide information on the study and to discuss specific concerns.

- Current study information and background materials were available at municipal offices. Municipal officials were regularly briefed throughout the study.

To encourage public involvement throughout the Route Stage study two major vehicles were used . These vehicles were: a Regional Committee; and Municipal Participation Centres.

The Regional Committee, established during the first step, was comprised of representatives from industry, municipal, and provincial levels of government, and regional groups interested in the environmental resources within the study area (Section 4.3). The committee met with Ontario Hydro throughout the study to review study developments and provide comment from their representative groups.

Municipal Participation Centres (MPCs) were designed to encourage residents and other interested individuals to participate in the study and provide comments. The MPCs, similar in format to open house workshops, were held in co-operation with local municipalities affected by the study. Two series of centres were held; one in the spring of 1983 to discuss alternative corridors, and the second in the fall of 1984 to discuss alternative routes. Residents were invited to attend the MPC through advertisements in the local media, meetings with the Regional Committee, letters and bulletins distributed to the mailing list. At MPCs the public were encouraged to discuss the study results, to identify their properties on the maps, and to provide local information which they felt Ontario Hydro should be aware of when identifying and comparing alternative routes. Information provided was bilingual.

A third series of MPCs will be held in the Spring of 1985 to present the recommended route and alternatives to residents in each township or municipality potentially affected.

2.3 Provincial Government Ministries

Provincial government ministries participated in the study by providing data, commenting on the study process, and reviewing the draft EA. This process follows the Guidelines for

Pre-submission Consultation issued by the Ministry of the Environment. These guidelines suggest that the proponent consult with all ministries and others who will be participants in the formal review and decision-making process.

On September 15, 1982, a letter was sent to interested provincial ministries to request an official contact for the study and invite them to attend an introductory meeting in Toronto on October 5, 1982. At the meeting, the study was introduced through a presentation of the study history and status, and handouts were provided which explained the planned Route Stage study process. Ministries were invited to participate in the study by designating a contact person and membership on the Regional Committee. The following is a tabulation of the ministries contacted and those which designated a contact person.

Provincial Ministry Contacted	EA Contact Appointed (x)	On Regional Committee (x)
Agriculture and Food	x	x
Community and Social Services	-	-
Citizenship and Culture	x	-
Energy	x	-
Environment	x	x
Health	-	-
Industry and Trade	x	-
Intergovernmental Affairs	-	-
Municipal Affairs and Housing	x	-
Natural Resources	x	x
Transportation and Communications	x	-
Treasury and Economics	-	-
Labour	-	-
Tourism and Recreation	x	-

A second meeting was held with the ministry contacts on March 16, 1983. At this meeting the project status, the alternative corridors, and the proposed information base for alternative route identification were presented and discussed and, comments on the process were requested. An information package consisting of the materials distributed on the study to date was mailed with the notes of meeting to those ministries who had designated a contact but did not attend the meeting.

On September 25, 1984, the alternative routes, the two proposed telecommunications sites and the alternative route evaluation and comparison process were presented for discussion. All ministries were requested to provide specific comments on the alternatives and the selection process so that these could be considered in the alternative route and site evaluation and the recommended route and site selection.

A partial draft of the EA was circulated for review by selected provincial government ministries and federal government agencies.

3.0 THE ENVIRONMENT

3.1 The Study Area

The study area used to identify alternative corridors encompassed approximately 1,530 square kilometres (590 square miles). Included in this area were all or part of eight townships within four counties, the eastern part of the Regional Municipality of Ottawa-Carleton and the City of Cornwall (Figure 3.1).

The study area boundaries excluded major built up areas and areas of environmental sensitivity while providing a large enough area to allow for the location of a reasonable number of alternatives.

The northern boundary of the study area followed the Canadian National Railway line from Hawthorne TS to the vicinity of the Village of Vars. It turned easterly through the southern part of the Larose Forest until it met a 230 kV transmission line near the Village of St. Isidore de Prescott. The Mer Bleue, a recognized sensitive biological and recreational feature, is adjacent to the north boundary of the study area. The northern boundary was established to allow for alternatives which would avoid higher quality agricultural land south of Highway 417 in the Casselman area.

The eastern boundary of the study area followed the boundary between Stormont and Glengarry counties. This boundary was located far enough east to include the less homogeneous agricultural land in the vicinity of Highway 138, south of Moose Creek Bog. The eastern boundary excluded a number of settlements including Alexandria and St. Isidore de Prescott, significant forest and wildlife areas, and Loch Garry.

The western boundary paralleled property fabric between Concessions V and VI in the City of Gloucester to the more southerly of two 115 kV transmission lines east of the Town of South Gloucester in the Township of Osgoode. It was located to exclude the Department of National Defense Base at Leitrim, the exclusion zone to the Ottawa International Airport, a large gravel pit and areas of urban development to the west.

The southern boundary parallelled the more southerly of two existing 115 kV transmission lines between Ottawa and Cornwall.

3.2 Description of the Environment

The study area includes two physiographic regions: the St. Lawrence Lowlands and the Ottawa Valley occupying the southern and northern portions, respectively. In the central and western portions, the study area landscape is predominantly flat and untreed. The northern and south-eastern portions have some relief and have more forest cover. The main rivers are incised and provide local relief in the relatively flat agricultural landscape. There are few hills to provide landmark features or scenic vistas, but those hills present provide some very long views, particularly north to the Gatineau Hills and south across the St. Lawrence River.

There are an estimated 128,000 permanent residents in the townships associated with the study area. Approximately 70 percent of this population is located in the City of Gloucester and Cumberland Township.

In the five year period from 1976-1981, the populations of approximately half of the study area townships have growth rates higher than the 4 percent provincial average. The most dramatic population increases occurred in the townships and cities in the Ottawa area, most notably Gloucester and Cumberland Township. Those townships which grew at a slower rate or lost population in that period included: Winchester, Finch, Roxborough, and South Plantagenet.

Within the study area, there are a variety of lifestyles. They include:

- urban dwellers who live and work in urban centres such as Ottawa and Cornwall;
- ex-urbanites who have chosen to relocate in rural areas and commute regularly to jobs in the urban centres. This is most common in the urban fringe of Ottawa and Cornwall;
- farmers who live and work primarily on family farms and regard the cities as service centres;
- rural non-farm residents who live and work in the study area.

With the exception of the City of Gloucester and Cumberland Township, where at least 55 percent of the total population lives in urban areas, the majority of townships within the study area are rural. This rural population is made up of both rural farm and rural non-farm populations. The rural non-farm population is numerically dominant in the study area. However, the farm populations in the townships of Cambridge, Winchester, Finch, Roxborough, and South Plantagenet represented at least 25 percent of the total population in their respective townships in 1981.

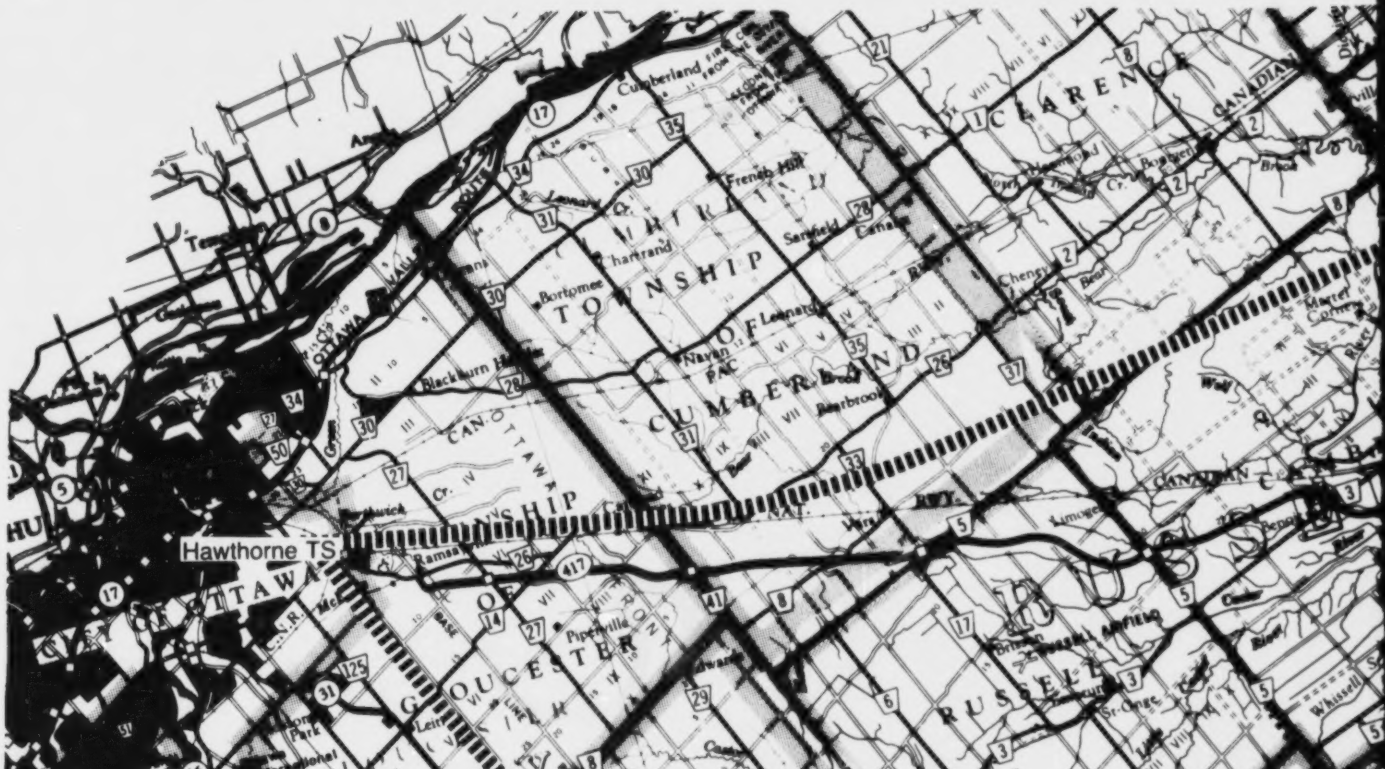
Relative to provincial age data, the 1981 population of the townships in the study area appear to be somewhat younger. This is based on a comparison of the size of population in the 0 to 14 and over 65 years age groups.

The frequency of French as the stated mother tongue was higher than the 1981 provincial average in all the study area townships except Osnabruck Township. The percentage of the townships' populations which stated French as the mother tongue ranged from a low of 5 percent in Osnabruck Township to a high of 74 percent in Cambridge Township. In Cambridge, South Plantagenet, and Russell townships, French is the mother tongue of the majority of residents. English is, however, widely spoken throughout the study area.

A thriving farming industry, composed principally of dairy and beef cattle operations, and grain and corn cash cropping is the predominant feature of the study area. The most significant farming locations are associated with the fertile till and clay plains.

Seventy-five percent of the farms within the study area obtained their income from dairy cattle in 1981. The gross value of agricultural products in 1981 was $108 million or 24 percent of the gross value of agricultural production within the Eastern Ontario Region. The capital value of these farm operations in 1981 was estimated at $737 million or 21 percent of the capital value of farms within the Region.

There were 2,432 farms within the study area in 1981. Ninety-five percent of the farm operators were resident farmers. Approximately 77 percent of the farms were privately owned. The average size of these farms was 73 hectares compared to the average size of farms in Eastern Ontario Region of 89 hectares.


Hawthorne TS
Chesterville TS
OTTAWA
CUMBERLAND
CLARENCE
TOWNSHIP OF CUMBERLAND
TOWNSHIP OF GLOUCESTER
RUSSELL
OSGOODE
WINCHESTER
NEPEAN
MUNICIPALITY OF CARLETON
Cumberland
French Hill
Sarsfield
Navan
Leonard
Bearbrook
Chartrand
Blackburn Hamlet
Pipersville
Edwards
Gloucester
Greely
Johnstons Corners
North Osgoode
Metcalfe
Kenmore
Spring Hill
Vernon
Russell
Embrun
Limoges
Cheney
Bourget
Marionville
Winchester
Chesterville
Manotick
Osgoode
Castor
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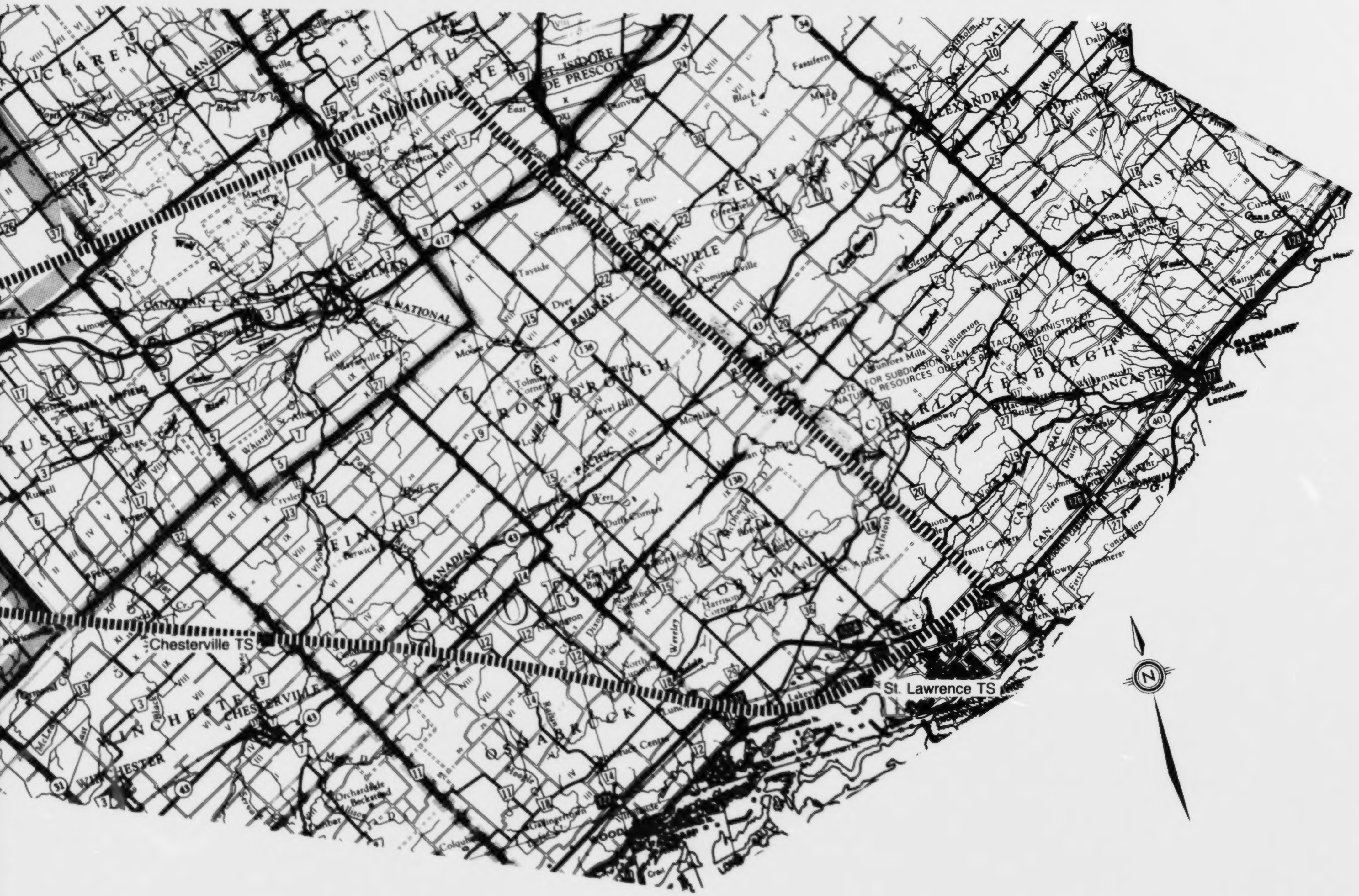
CLARENCE
SOUTH PLANTAGENET
ST. ISIDORE DE PRESCOTT
KENYON
LOCHIEL
ALEXANDRIA
LANCASTER
CHARLOTTENBURGH
ROXBOROUGH
RUSSELL
CAMBRIDGE
FINCH
OSNABRUCK
WINCHESTER
CHESTERVILLE
CORNWALL
GLENGARRY PARK
Chesterville TS
St. Lawrence TS
N

Figure 3.1
Study Area

Legend

▮▮▮▮▮▮▮ Study area boundary

■ Transformer Station TS

Note: All boundaries are approximate

MF. Roll No.	Rev.	Date	Particulars	Drawn	App'd.

Ontario Hydro

Design and Development Division - Transmission

Drawn by K. Kolyn	Supervising Planner
Date March 1985	Supervising Project Engineer
Work Order 840-03016	Graphics Prod. Supervisor S. Henderson

Scale	Drawing No.	Rev	Sheet
1:250,000	RS170-LUEP-RA6-0050	0	1 of 1

Labour force by industrial sector data were only available for 1971. Based on these data, the contribution of agricultural sector employment to total employment ranged from 1.5 percent (Ottawa-Carleton) to 17.6 percent (Prescott and Russell). Regionally, agriculture provided 4.8 percent of the total employment.

There are no lakes within the study area. There are, however, a number of rivers such as the South Nation, Castor, and Raisin Rivers with incised banks and numerous meanders. The rivers are inhabited by pickerel, smallmouth bass, pike, and other warm-water species. A worked out quarry in the Cornwall area and two streams provide the only cold water fish habitat. All are stocked by the Ministry of Natural Resources with either brook or speckled trout.

Deer are found largely in the Newington and Morewood bogs and the forested areas north and west of Cornwall. Moose may be found in the Larose Forest. Other large and small mammals inhabit the more forested areas. Waterfowl and upland game birds such as grouse and woodcock are present.

As a result of local variations in soils and climate, vegetation varies throughout the study area. There is a wide range of coniferous and deciduous species, typical of the Great Lakes - St. Lawrence Forest Region. Forest resources include farm woodlots, mixed-forest stands in the major wetland areas, and coniferous stands in the Larose Forest. Maple sugar bush operations are found in the study area, but are most significant in Roxborough and Cornwall townships. About 51 farmers were engaged in maple syrup production in the study area in 1981. The gross value of these operations was estimated at approximately $60,000.

The forest industry in eastern Ontario supports primarily very small, single-industry communities, and employed less than one percent of the regional labour force in 1971. The timber harvested from woodlots and re-forested areas consisted of softwoods and hardwoods suitable for pulp and paper, veneers, board lumber and fuelwood.

Within the Eastern Ontario Planning Region, there were approximately 97 private woodland operations identified in 1981. The gross value of the wood for these private operations was estimated at $150,000. Thirteen mills contributed an estimated $6 million in value and employed 265 people in the manufacture of wood products within the study area. Most are small operations producing less than one million board feet of lumber. There was one pulp mill, Domtar Wood Products, operating near the study area employing approximately 1,300 people in 1982. Production contributed a value added of about $49 million in 1982.

Previous archaeological fieldwork has uncovered evidence indicating that man has lived in the area for over 11,000 years. This time period can be sub-divided into four basic periods, each associated with cultural changes in early man's development. Firstly, the Paleo-Indian Period (circa 9000 BC - 5000 BC), was characterized by small bands of wandering hunters and gatherers in the Frontenac Axis. Secondly, the Archaic Period (circa 5000 BC - 1000 BC) differed from the Paleo-Indian in that copper and stone tools were used. Thirdly, the Initial Woodland Period (circa 1000 BC - AD 1000) marked the introduction of pottery. Finally, the Terminal Woodland Period (circa AD 1000 - Historic Period), was characterized by the introduction of corn agriculture and a more sedentary way of life.

It was not until the late 1700s that European settlement commenced in earnest with the influx of United Empire Loyalists from the United States. The 1800s witnessed a steady

increase in local agricultural, forestry, commercial, and industrial activities. By the end of the 19th century, however, the focus of the economy of eastern Ontario had began to shift toward tourism and recreation. The study area has not reflected this shift and remains primarily agrarian. Population tended to be centred in Ottawa and Cornwall, with small towns and villages scattered throughout. These functioned as service centres for the agricultural industry.

Mineral aggregate resources include sand and gravel and crushable limestone. The sand and gravel deposits are located mostly in Stormont County and, to a lesser extent, in Dundas County. These aggregate resources are found in beach and deltaic deposits formed by the Champlain Sea. The crushable limestone deposits are largely confined to the townships of Winchester, Finch and Cornwall, and generally coincide with the distribution of known aggregate deposits.

4.0 INTRODUCTION OF THE STUDY AND ALTERNATIVE CORRIDOR DEVELOPMENT

4.1 General

This section describes study introduction, data collection, and identification of alternative corridors. The corridors were continuous linear pathways of varying widths, generally located through areas of lower environmental constraint. These areas were further examined to locate and assess alternative routes for the proposed 500 kV transmission line.

4.2 Study Introduction and Announcement

In September 1982, Ontario Hydro held introductory meetings with municipal officials within the study area. At these meetings, the history of the project, study process, and public involvement programme were outlined. Emphasis was placed on how municipalities and the public could become involved in the study through Municipal Participation Centres. The concept of such centres, held in each municipality at key study steps, was supported by those contacted.

On November 5, 1982 following the release of the Joint Board Decision regarding the Plan Stage (refer to Volume I), the commencement of the Route Stage study was formally announced to the public. To accomplish this a communication plan was initiated which included the distribution of a release to news media in the study area, and a study backgrounder to all people on the mailing list.

Throughout November, 1982, Ontario Hydro contacted municipalities and organizations within the study area to provide background information on the study and outline the Route Stage study activities. Ontario Hydro met with local media to provide information and answer questions regarding the study. Briefings were also held with provincially elected officials during this period.

4.3 Formation and Role of the Regional Committee

In November, 1982, contacts were made with many regional and local organizations and municipalities to recruit membership for the Regional Committee. Letters of invitation were mailed to provincial interest groups and provincial government ministries were invited to participate on the Committee.

The primary role of the Regional Committee was to assist Ontario Hydro in locating transmission corridors by providing a regional overview of the issues and concerns related to locating transmission lines. For complete terms of reference, see Appendix C1.2.

To carry out this role, members were requested to:

- advise on the importance of criteria used to identify alternative corridors;
- act as liaison between the project team and their parent organization;
- review and comment on key decisions throughout the Route Stage study.

Criteria for membership were set as follows:

- Committee members should be representative of municipalities, provincial or federal agencies, regional interest groups, or the private sector who had an interest in the study area;

- Committee members should be available to attend a total of five meetings within twelve months;

- If an individual not representing an organization expressed an interest in being on the Committee, then the individual was invited to attend meetings as an observer and could become an official member if the group accepted the individual.

The Regional Committee consisted of twenty-four members (Appendix C1.1). The group met in Cornwall on November 20, 1982, for orientation and to review and confirm their terms of reference and membership. The overall study process was discussed and study information was provided to them.

Further activities of the Regional Committee are outlined in subsequent sections of this report and summarized in Appendix C1.3.

4.4 Corridor Step Data Collection

Fifty-four types of land use and environmental data were collected and mapped at a scale of 1:50,000. Municipal official plans, zoning by-laws, and policies were reviewed. Information was gathered from published and unpublished sources, federal, provincial and municipal government agencies, local groups and organizations, and through field investigation and interpretation of aerial photographs. A list of data types and sources is in Appendix B1.

Socio-economic information was available on a township basis and therefore collected at this level. Resource economic data were collected for the Eastern Ontario Planning Region as defined by the provincial government (Appendix B6). Data were not available on a study area basis.

4.4.1 Development of Factors, Environmental Situations and Objective Statements

In order to examine the individual data types of the land use and environmental resources, a large amount of diverse environmental information was organized into nine general categories. Each category is referred to as a resource factor and these were:

- Agricultural Resources - This factor considered the soil capability for agriculture and the present agricultural land use patterns, reflecting the type of farming operations.

- Appearance of the Landscape - This factor considered the visual characteristics of the landscape, and the potential for visibility of transmission lines in various settings.

- Biological Resources - This factor considered areas of biological sensitivity: floral and faunal components of the terrestrial and aquatic environment, such as deer concentration areas, heronries, unique/sensitive plant and animal communities, wildlife habitat, spawning areas and wetlands.

- Forest Resources - This factor considered the existing and potential resource use and quality of the forest based on the species composition, the capability of the land to produce renewable forest resources, the degree of investment and management in the land, and the use of existing stands for research plots and maple sugar production.

- Heritage Resources - This factor considered the prehistory and history of the study area through an analysis of known and potential archaeological sites, recognized historic buildings and settlements, and significant cultural landscapes.

- Human Settlement - This factor considered the predominantly man-made environment including residential, industrial, recreational, commercial and institutional facilities, as well as related transportation and communication facilities. Also included were proposed (but not yet developed) land uses and facilities.

- Mineral Resources - This factor considered the mineral aggregate industry through an analysis of existing and planned extractive operations (pits, quarries and mines) and potential aggregate deposits. It also included those geologic sites with recognized scientific value.

- Recreation Resources - This factor considered present and proposed use of public, private, commercial and institutional sites in terms of facilities and associated recreational activities.

- Engineering and Cost Constraint - This factor considered those aspects of the natural environment (such as unstable Leda clays) which may pose a significant engineering or cost constraint to the building of transmission lines.

Thirty environmental situations within the nine factor categories were developed from the data collected. These situations identified specific environmental characteristics which were recognized as important within the study area and which could be affected by transmission facilities.

An objective statement was then defined for each of the identified situations. The objective statement included a directive to avoid the situation, a description of the data types used to develop the situation and its general location in the study area, an explanation of the value of the situation to the local and/or regional land use and natural resource base, a description of the possible transmission line effects on the situation and, finally, a summary of the possible mitigation measures which could minimize expected effects.

A detailed description of the objective statement format and criteria is found in Appendix B2. The environmental factors and objective statements are described in Appendix B3. Factor maps, illustrating the geographical location of the situations for each factor, are found in Appendix B4.

4.4.2 Rating of Objective Statements

Since it was not possible to avoid all of the identified environmental situations, it was necessary to establish relative priorities, based upon the information contained in the objective statements. In order to do this, a four step rating scheme was undertaken jointly by the Regional Committee and Ontario Hydro (Figure 4.1). The criteria used to establish the relative level of priority among objectives are presented in Appendix B5.

4.4.2.1 Resource Value

The committee members rated the resource value of each of the 30 objective statements on a scale of one to five at a meeting in December 1982. The value of the resource was considered in terms of its significance, prevalence, sensitivity, and inter-relationships among other objective statements (Appendix B2 under the resource value description). Individual committee members' ratings were mailed to Ontario Hydro. These were tabulated, summarized, and the results were discussed at the next committee meeting. As a result of group discussion, a second round of resource value ratings was undertaken. The results were tabulated, discussed, and accepted by the committee (Table 4.1).

4.4.2.2 Possible Effects

Initially, Ontario Hydro developed the possible effects ratings for each objective. The method employed was to rate the possible effects on a scale from one to five using the possible effects column of the rating criteria table (Appendix B5). The possible effects of the transmission line included the type of effect, extent, intensity, duration and frequency (Appendix B2).

The possible effects ratings were tabulated and discussed with the committee. The committee members felt that they would like an opportunity to rate the possible effects to see if their results would differ significantly from those prepared by Ontario Hydro. This was done, again on an individual basis and discussed among all members and accepted by the whole committee.

The ratings which the committee developed for possible effects were almost the same as the Ontario Hydro rating. Where there were differences, they were evaluated and found to not significantly affect the overall objective statement rating. Ontario Hydro used the possible effects ratings developed by the Regional Committee (Table 4.2).

4.4.2.3 Overall Rating of Objectives

To develop a list of objectives in order of priority, the resource value and possible effects ratings were combined together to arrive at an overall rating. Table 4.3 provides a list of objectives, their overall rating, and the percent of the study area which they occupy.

When the overall rating was completed a number of objectives received the same overall value while a number were very close in value. Many of the higher rated objectives covered very little of the study area while a number of the middle rated objectives covered an extensive area.

It became apparent that a grouping of objectives would be required to develop a constraint map which would have enough definition to allow identification of alternative

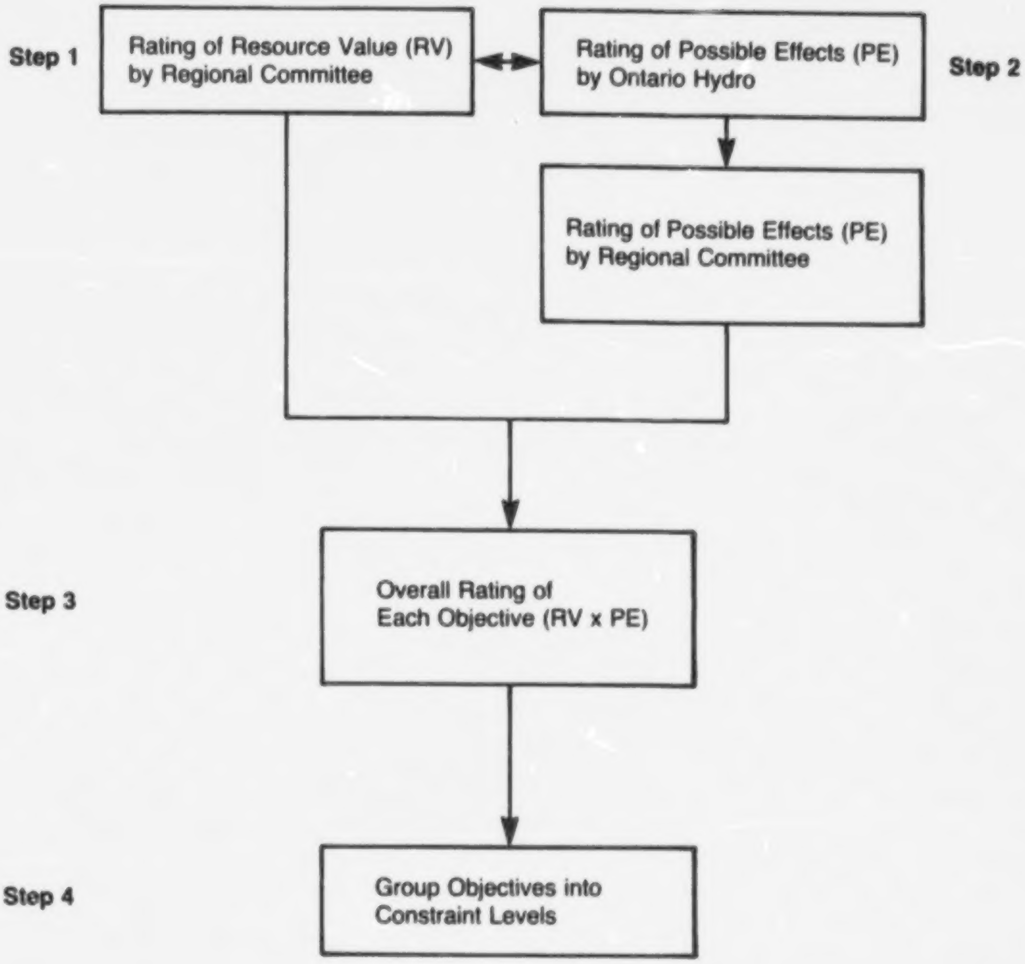
Step 1
Rating of Resource Value (RV) by Regional Committee
Rating of Possible Effects (PE) by Ontario Hydro
Step 2
Rating of Possible Effects (PE) by Regional Committee
Step 3
Overall Rating of Each Objective (RV x PE)
Step 4
Group Objectives into Constraint Levels

Figure 4.1
Rating of Objectives

Table 4.1
Summary - Resource Value Rating

Date: December 3, 1982
Revision O

Legend
- Low 1
- Moderately Low 2
- Moderate 3
- High 4
- Very High 5

Factor	Agricultural Resources				Appearance Of The Landscape				Biological Resources							Forest Resources					Heritage Resources			Human Settlement				Mineral Resources			Recreation Resources						Engineering Cost Constraints	
Committee Members																																						
Fred Alexander	4	4	3	2	2	3	3		2	2	2	2	1	1		3	2	2	3		3	2	2	[illegible]	3	3	3	1	1	2	1	1					1	
Osgoode Township																																						
Barry Armstrong	5	5	4	3	5	3	*2		3	3	3	2	2	2		4	3	3	2		3	3	3	4	4	5	4	3	3	3	3	4					2	
Stormont OFA																																						
Gerry Bertrand	5	5	5	4	4	3	2		3	1	3	3	3	1		5	4	3	4		1	1	1	5	5	5	5	5	4	3	5	4					5	
Cambridge Township																																						
Terry Blair	5	3	3	1	3	3	1		5	3	3	4	3	1		4	3	3	2		5	4	3	4	4	2	4	5	5	3	3	4					4	
Minerals (Contractor)																																						
Vivian Brownell	3	2	2	1	2	5	1		5	5	5	5	5	5		5	3	4	4		5	3	4	2	2	1	2	1	3	4	5	1					3	
Biology (Ottawa Field Naturalists)																																						
Carl Burke	4	2	2	1	5	3	4		5	3	3	3	3	1		4	5	4	4		2	2	4	3	4	2	2	4	3	3	3	3					5	
Forestry (Domtar)																																						
Jim De Haan	5	4	3	1	3	4	3		4	2	5	4	3	1		4	3	3	1		5	4	4	4	3	2	3	4	3	3	3	3					4	
Direct User (CIL)																																						
Cliff Howse	5	5	3	3	3	4	2		4	4	3	2	2	1		5	4	3	2		4	3	3	3	3	3	2	3	2	2	3	3					3	
Dundas County OFA																																						
Norvan Grant	4	3	1	2	1	2	1		4	4	4	3	4	2		4	5	4	2		2	2	3	5	5	2	5	5	5	3	4	5					3	
Minerals (Cornwall Gravel)																																						
Robert Grattin	5	5	4	1	4	2	2		3	3	5	5	3	1		4	2	3	1		4	2	1	4	4	1	3	3	3	1	3	3					3	
Russell OFA																																						
John MacDonald	5	5	5	5	4	4	4		3	2	2	2	2	1		4	3	2	2		4	3	3	4	4	3	4	2	2	2		3	3				4	
OMAF																																						
Myles Mahon	5	4	4	3	3	3	3		5	4	4	3	3	1		5	3	2	1		5	3	3	5	4	4	3	4	4	3		5	4				4	
Ottawa Carleton Planning																																						
Bryan McCue	4	4	3	2	3	4	2		5	5	5	5	4	4		5	4	4	3		5	4	4	3	3	3	3	3	3	3		4	4				5	
Ministry of Natural Resources																																						
Chuck Miller	5	5	4	4	4	4	3		5	5	5	5	3	3		5	5	4	3		5	3	3	5	4	4	5	4	4	3		5	5				4	
Stormont Dundas Glengarry Planning																																						
Bill Moulton	4	4	2	1	3	2	2		4	4	3	3	2	2		4	3	4	2		4	3	3	3	3	2	3	2	3	2		4	3				3	
Association of Municipal Electric Utilities																																						
Gaston Patenaude	5	4	3	1	4	4	2		4	2	1	3	2	1		4	5	4	2		4	3	3	5	4	5	4	3	4	2		3	5				4	
Russell Township																																						
Jim Pendergast	4	4	4	4	4	4	4		4	4	4	4	4	4		4	4	4	4		4	4	4	4	4	4	4	4	4	4		4	4				4	
Ontario Archaeological Society																																						
Barbara Seargeant	5	4	1	1	3	4	2		5	2	5	5	4	1		4	4	5	3		4	5	4	1	1	5	4	4	4	4		5	1				4	
Ontario Historical Society																																						
David Sherwood	5	4	4	3	4	3	2		5	4	2	4	4	2		5	4	[illegible]	1		5	3	3	5	4	2	5	5	4	3		5	5				5	
Canadian Institute of Planners																																						
Lawrence St. Denis	5	5	5	4	2	3	1		4	4	4	3	3	2		5	[illegible]	4	3		3	1	1	5	5	3	2	4	4	2		4	[illegible]				3	
Glengarry OFA																																						
Bill Stevens																																						
Ministry of Environment																																						
Jim Windsor	4	4	3	2	3	4	3		3	3	3	2	2	2		4	4	4	3		3	3	3	4	4	4	4	3	3	3		4	4				3	
South Nation Conservation Authority																																						
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	71	[illegible]		[illegible]	[illegible]	74	72	[illegible]	[illegible]		[illegible]	77	72	[illegible]		[illegible]	61	[illegible]	81	77	[illegible]	[illegible]	72	71	[illegible]	[illegible]	[illegible]					[illegible]	
Average	4.6	4.0	3.2	2.3	3.3	3.4	2.3		4.0	3.3	3.5	3.4	3.0	1.9		4.3	3.7	3.4	2.5		3.8	2.9	3.0	3.8	3.7	3.1	3.6	3.4	3.4	3.6	3.6	3.5					3.9	

Table 4.2
Summary - Possible Effects Rating

Date: January 4, 1983
Revision 2

Legend
Low 1
Moderately Low 2
Moderate 3
High 4
Very High 5

Factor

Committee Members	Objectives to Avoid							Agricultural Resources						Appearance Of The Landscape				Biological Resources							Forest Resources			Heritage Resources		Human Settlement	Mineral Resources	Recreation Resources	Engineering Cost Constraints
Fred Alexander Osgoode Township	3.5	3.5	[illegible]	2.5	[illegible]	3.5	2.5	3.5	4.0	3.5	2.5	2.5	2.5	4.0	4.0	3.5	3.0	3.5	2.5	2.0	4.5	4.5	4.0	3.5	3.5	3.0	2.5	3.5	3.5				5.0
Barry Armstrong Stormont OFA	[illegible]	[illegible]	5.0	4.0	[illegible]	[illegible]	2.0	4.0	3.0	3.0	3.0	3.0	1.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	5.0	3.0	3.0	3.0	4.0				4.0
Gerry Bertrand Cambridge Township	[illegible]	[illegible]	5.0	4.0	4.0	[illegible]	[illegible]	4.0	3.0	3.0	3.0	4.0	3.0	5.0	4.0	3.0	4.0	2.0	2.0	2.0	5.0	5.0	5.0	5.0	4.0	3.0	[illegible]	4.0	4.0				5.0
Terry Blair Minerals (Contractor)	3.5	3.5	3.5	2.5	3.0	3.5	2.5	3.5	4.0	3.5	2.5	2.5	2.5	4.0	4.0	3.5	3.0	3.5	2.5	2.0	4.5	4.5	4.0	3.5	5.0	3.0	2.5	3.5	3.5				5.0
Vivian Browne Biology (Ottawa Field Naturalists)	4.0	3.5	3.0	2.5	3.0	3.5	2.0	5.0	4.5	3.5	3.0	3.0	3.5	5.0	4.0	3.5	3.0	3.5	2.5	2.0	4.0	4.0	3.0	3.5	3.5	3.0	2.5	4.0	3.5				5.0
Carl Burke Forestry (Domtar)	4.0	[illegible]	2.0	2.0	3.0	4.0	2.0	4.0	4.0	4.0	1.0	1.0	2.0	5.0	5.0	5.0	5.0	3.0	2.0	4.0	3.0	4.0	3.0	2.0	4.0	2.0	1.0	2.0	3.0				5.0
Jim De Haan Direct User (CIL)	[illegible]	4.0	4.0	2.0	3.0	4.0	2.0	4.0	5.0	4.0	2.0	3.0	2.0	5.0	4.0	4.0	3.0	4.0	3.0	2.0	5.0	5.0	4.0	4.0	3.0	2.0	3.0	4.0	3.0				5.0
Cliff Howse Dundas County OFA	4.0	4.0	3.5	2.5	3.0	3.5	2.5	3.5	3.5	3.5	3.0	2.5	2.5	4.0	3.5	3.5	2.5	3.5	2.5	2.0	4.5	4.5	3.5	3.0	3.5	3.0	2.5	3.5	3.5				5.0
Norvan Grant Minerals (Cornwall Gravel)	[illegible]	2.0	2.0	[illegible]	[illegible]	[illegible]	[illegible]	3.0	3.0	4.0	2.0	2.0	1.0	5.0	5.0	5.0	4.0	4.0	2.0	1.0	4.0	4.0	4.0	4.0	5.0	4.0	3.0	4.0	4.0				4.0
Robert Grafton Russell OFA	4.5	4.5	3.5	2.5	3.0	3.5	2.5	3.5	4.0	3.5	2.5	2.5	2.5	4.0	4.0	3.5	3.0	3.5	2.5	2.0	4.5	4.5	4.0	3.5	3.5	3.0	2.5	3.5	3.5				5.0
John MacDonald OMAF	4.0	3.5	3.5	3.0	3.0	3.5	2.5	3.5	4.0	3.5	2.5	2.5	2.5	4.0	3.5	3.5	2.5	3.5	2.5	2.0	4.5	4.5	4.0	3.5	3.5	3.0	2.5	3.5	3.5				5.0
Myles Mahon Ottawa Carleton Planning	4.0	4.0	4.0	[illegible]	4.0	4.0	[illegible]	5.0	4.0	3.0	2.0	2.0	2.0	5.0	4.0	3.0	2.0	4.0	2.0	2.0	5.0	5.0	4.0	3.0	3.0	2.0	2.0	4.0	4.0				5.0
Bryan McCue Ministry of Natural Resources	3.5	3.5	3.5	2.5	3.0	3.5	2.5	4.0	4.0	4.0	3.0	3.0	3.0	4.0	4.0	3.5	3.0	3.5	2.5	2.0	4.5	4.5	4.0	3.5	3.5	3.0	3.0	3.5	3.5				5.0
Chuck Miller Stormont Dundas Glengarry Planning	4.0	4.0	4.0	4.0	[illegible]	[illegible]	2.5	4.0	4.0	4.0	3.0	3.0	3.0	5.0	5.0	5.0	5.0	3.0	2.0	2.0	5.0	5.0	[illegible]	[illegible]	4.0	4.0	4.0	4.0	4.0				5.0
Bill Moulton Association of Municipal Electric Utilities	3.5	3.5	3.5	2.5	3.0	3.5	2.5	3.5	4.0	3.5	2.5	2.5	2.5	4.0	4.0	3.5	3.0	3.5	2.5	2.0	4.5	4.5	4.0	3.5	3.5	3.0	2.5	3.5	3.5				5.0
Gaston Patenaude Russell Township	4.0	3.5	3.5	2.5	4.0	3.5	2.5	3.5	4.0	3.5	2.5	2.5	2.5	4.0	4.0	3.5	3	3.5	2.5	2.0	4.5	4.5	4.0	3.5	3.5	3.0	2.5	3.5	3.5				4.0
Jim Pendergast Ontario Archaeological Society	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4	4.0				4.0
Barbara Seargeant Ontario Historical Society	4.0	3.5	3.5	2.0	3.0	3.5	2.0	4.0	4.0	4.0	3.0	2.5	2.0	4.0	4.0	4.0	3.0	4.0	3.5	2.0	4.0	4.0	3.5	3.5	4.0	3.0	3.0	4.0	3.0				5.0
David Sherwood Canadian Institute of Planners	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.0	[illegible]	3.0	2.0	5.0	2.0	1.0	1.0	3.0	4.0	3.0	2.0	4.0	1.0	2.0	5.0	4.0	2.0	4.0	4.0	3.0	2.0	3.0	3.0				5.0
Lawrence St. Denis Glengarry OFA	4.0	4.0	4.0	3.0	4.0	3.5	2.5	3.5	4.0	3.5	2.5	2.5	2.5	4.5	4.5	4.0	3.5	3.5	2.5	2.0	4.5	4.5	4.0	3.5	3.5	3.0	2.5	3.5	3.5				5.0
Bill Stevens Ministry of Environment																																	
Jim Windsor South Nation Conservation Authority	3.5	3.5	3.5	2.5	3.0	3.5	2.5	3.5	4.0	3.5	2.5	2.5	2.5	4.0	4.0	3.5	3.0	3.5	2.5	2.0	4.5	4.5	4.0	3.5	3.5	3.0	2.5	3.5	3.5				5.0
Total	82.0	76.8	74.0	56.5	63.0	71.0	[illegible]	79.5	80.0	77.0	54.0	54.0	50.0	90.5	85.5	79.0	67.5	73.5	53.5	46.0	93.0	93.0	80.0	76.5	79.5	63.0	53.0	75.0	74.5				96.0
Average	[illegible]	3.7	3.5	2.7	3.0	3.4	[illegible]	3.8	3.8	3.7	2.6	2.6	2.4	4.3	4.1	3.8	3.2	3.5	2.5	2.2	4.4	4.4	3.8	3.6	3.8	3.0	2.7	3.6	3.6				4.8

RS170-LUEP-RA-3001
RS-170-LUEP-RA6-0050

TABLE 4.3

Overall Rating of Objectives

	Objective	Overall Rating	Percent Area Coverage
1.	Seed production areas, experimental forest areas, maple sugar operations	18.5	1
2.	Specialty crop production areas and CLI soil capability class 1 in agriculture	17.9	3
3.	Sensitive/unique geologic features	17.3	1
4.	Existing urban settlements	17.2	1
5.	Existing rural settlements	16.3	1
6.	Intensively managed forest areas	15.2	11
7.	Rare/unique biological areas	15.2	5
8.	CLI soil capability classes 2, 3 in agriculture with drains	14.8	14
9.	Conservation areas	13.7	1
10.	Confirmed archaeological/ known historical sites	13.3	1
11.	Deer winter concentration areas	13.0	4
12.	Valuable species - young to mature forests	13.0	1
13.	Approved residential developments	13.0	1
14.	Active pits and quarries	13.0	2

	Objective	Overall Rating	Percent Area Coverage
15.	Existing private/commercial/ public facilities	12.6	1
16.	Biologically sensitive wetlands	12.5	2
17.	Existing institutional, commercial and industrial facilities	11.8	1
18.	Landscapes that are characterized as remnant natural landscapes	11.6	3
19.	CLI soil capability classes 2, 3 in agriculture without drains	11.2	33
20.	Areas of high sand and gravel reserve potential	10.2	5
21.	Viewsheds of existing settlements	9.9	26
22.	Waterfowl habitat	8.8	1
23.	Intermediate to low value - young to mature forests	8.0	18
24.	Cold and warm water fisheries	7.8	2
25.	Geologic sites and features with known value	7.6	5
26.	Potential archaeological sites and areas	7.3	12
27.	Historically representative cultural landscapes	6.6	17
28.	CLI soil capability classes 4 in agriculture	6.2	9
29.	Viewsheds of highways in flat, untreed landscapes	5.3	5
30.	Wetlands with no identified biological significance	4.6	2

corridors. Objectives to be grouped together would be similar with respect to overall rating and study area coverage. Maps could then be produced which would display the various levels of constraint.

4.4.2.4 Constraint Levels

A number of different levels of constraint were tried (from five to ten levels) and it was determined that having six constraint levels produced the most useful differentiation. Table 4.4 illustrates the rated objectives by constraint levels. Each level is described as follows:

- Level 1 included those objectives which were small in area and high in their overall rating;

- Level 2 included two objectives which received the same high rating and covered a greater area than those in level 1;

- Level 3 separated the second highest agricultural objective from the second highest forestry objective in Level 2;

- Level 4 combined a large number of objectives with moderate to moderately high ratings;

- Level 5 separated the single agricultural objective with the largest area (33 percent); and

- Level 6 combined the remainder of the objectives.

4.4.3 Constraint, Diversity and Suitability Maps

Three maps were developed to assist in the location of alternative transmission corridors. These include the constraint, diversity, and suitability maps.

- Environmental Constraint Map - Figure 4.2

An environmental constraint map was prepared to display the seven constraint levels. This map was used as a base to develop alternative corridors which were linear pathways in areas of relatively low level constraints. In some instances, all high level constraint areas could be avoided by corridors, while in others, it became necessary to pass through higher level constraint areas in order to connect areas of low constraint.

- Environmental Diversity Map - Figure 4.3

An environmental diversity map was prepared to display the number of identified situations occurring in any given location. This map complemented the constraint map in establishing corridor boundaries in areas of uniform constraint (one constraint level), by defining the edge between single and/or multiple situations. The diversity map was particularly useful in urban areas and along the agriculture - forest lands interface.

Table 4.4
Rated Objectives by Constraint Levels

LEVEL OF CONSTRAINT	OBJECTIVE	CUMULATIVE % AREA COVERAGE
Level 1	• Seed production areas, experimental forest areas, maple sugar operations • Specialty crop production areas and CLI soil capability class 1 in agriculture • Sensitive/unique geologic features • Existing urban settlements • Existing rural settlements	6.7 %
Level 2	• Intensively managed forest areas • Rare/unique biological areas	20.7 %
Level 3	• CLI soil capability classes 2, 3 in agriculture with drains	33.2 %
Level 4	• Conservation areas • Confirmed archaeological/known historical sites • Deer winter concentration areas • Valuable species – young to mature forests • Approved residential developments • Active pits and quarries • Existing private/commercial/public facilities • Biologically sensitive wetlands • Existing institutional, commercial and industrial facilities • Landscapes that are characterized as remnant natural landscapes	43.2 %
Level 5	• CLI soil capability classes 2, 3 in agriculture without drains	72.3 %
Level 6	• Areas of high sand and gravel reserve potential • Viewsheds of existing settlements • Waterfowl habitat • Intermediate to low value – young to mature forests • Cold and warm water fisheries • Geologic sites and features with known value • Potential archaeological sites and areas • Historically representative cultural landscapes • CLI soil capability class 4 in agriculture • Viewsheds of highways in flat, untreed landscapes • Wetlands with no identified biological significance	95.0 %

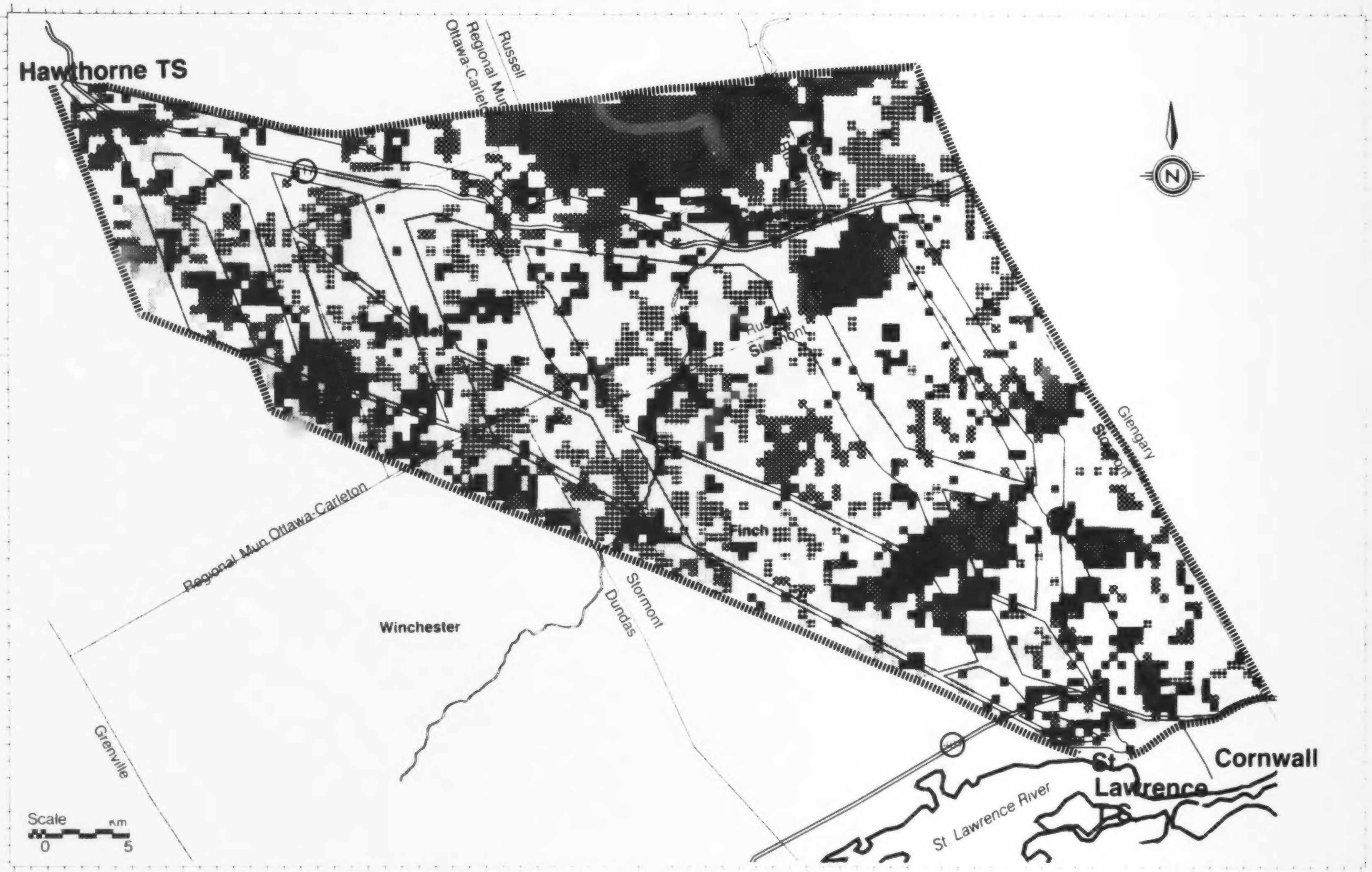
Hawthorne TS
Russell
Regional Mun Ottawa-Carleton
Russell
Prescott
Russell
Stormont
Glengary
Stormont
Finch
Regional Mun Ottawa-Carleton
Stormont
Dundas
Winchester
Grenville
Cornwall
St. Lawrence
St. Lawrence River
Scale
km
0
5
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Figure 4.2
Environmental Constraint Map – ERERP

Legend

▮▮▮▮	Study Area Boundary
═	Corridor Boundary
TS	Transformer Station
■	Constraint Level 1 (Rated Objectives 1-5)
▦	Constraint Level 2 (Rated Objectives 6&7)
▦	Constraint Level 3 (Rated Objective 8)
■	Constraint Level 4 (Rated Objectives 9-18)
☐	Constraint Level 5 (Rated Objective 19)
☐	Constraint Level 6 (Rated Objectives 20-30)
☐	No Objectives Occurring

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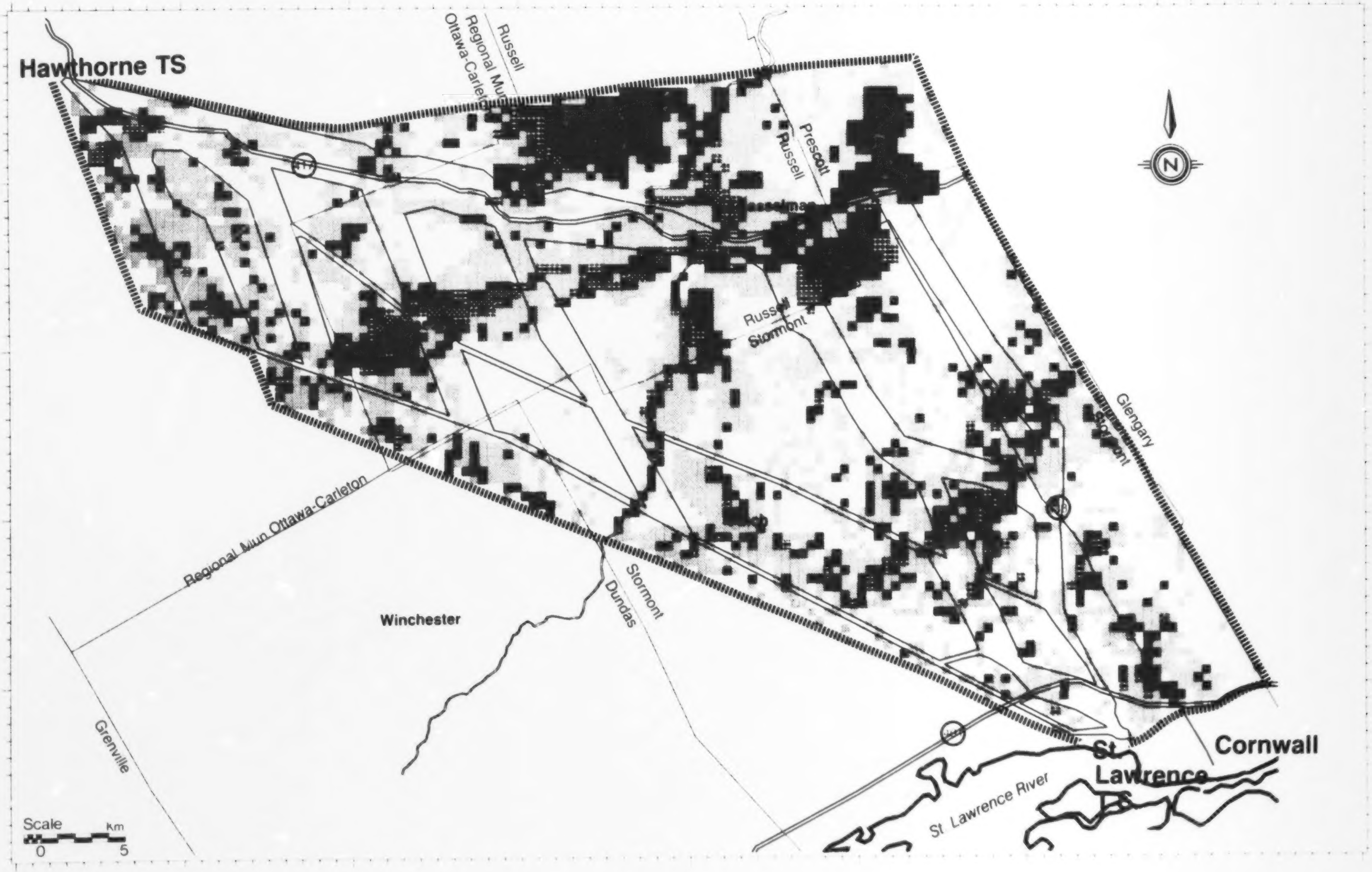
Hawthorne TS
Russell
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Ottawa-Carleton
Prescott
Russell
Russell
Stormont
Glengary
Stormont
Regional Mun Ottawa-Carleton
Stormont
Dundas
Winchester
Grenville
St Lawrence River
St
Lawrence
Cornwall
Scale
km
0
5

Figure 4.3
Environmental Diversity Map – ERNFC

Legend

- Study Area Boundary
- Corridor Boundary
- TS Transformer Station
- ☐ No Factors Occurring
- ☐ 1 Factor Occurring
- ░ 2 Factors Occurring
- ■ 3 Factors Occurring
- ▦ 4 Factors Occurring
- ▥ 5 Factors Occurring
- ■ 6 Factors Occurring

- Suitability Map - Figure 4.4

A suitability map was developed to display existing transmission facilities, other linear severances, and the fabric of the land. It was used to locate corridor segments parallel to existing linear facilities, and fabric of the land to take advantage of property boundary route locations.

4.5 Location of Alternative Corridors

The alternative corridors were located with the aid of guidelines developed by Ontario Hydro (Table 4.5). The constraint, suitability, and diversity maps and knowledge of the area were used to locate a number of alternative corridors. These alternative corridors are illustrated on the constraint and diversity maps. The process for locating corridors was based on 1:50,000 scale data as displayed on the environmental constraint map. The corridors represented a reduction in the study area by about 75 percent. These corridors contained areas which had the potential to be more environmentally acceptable for constructing a transmission line than other locations within the study area.

4.6 Description of Alternative Corridors

Three major alternative corridors were identified between Cornwall and Ottawa. Two of the corridors ABHINOR and FGLMPR followed existing transmission line rights of way while the third ABCDE followed Highway 417. Six north-south corridors connected these three east-west corridors. These were: AF; BG; CHL; DIM; EJNQ; and EKOR (Figure 4.5).

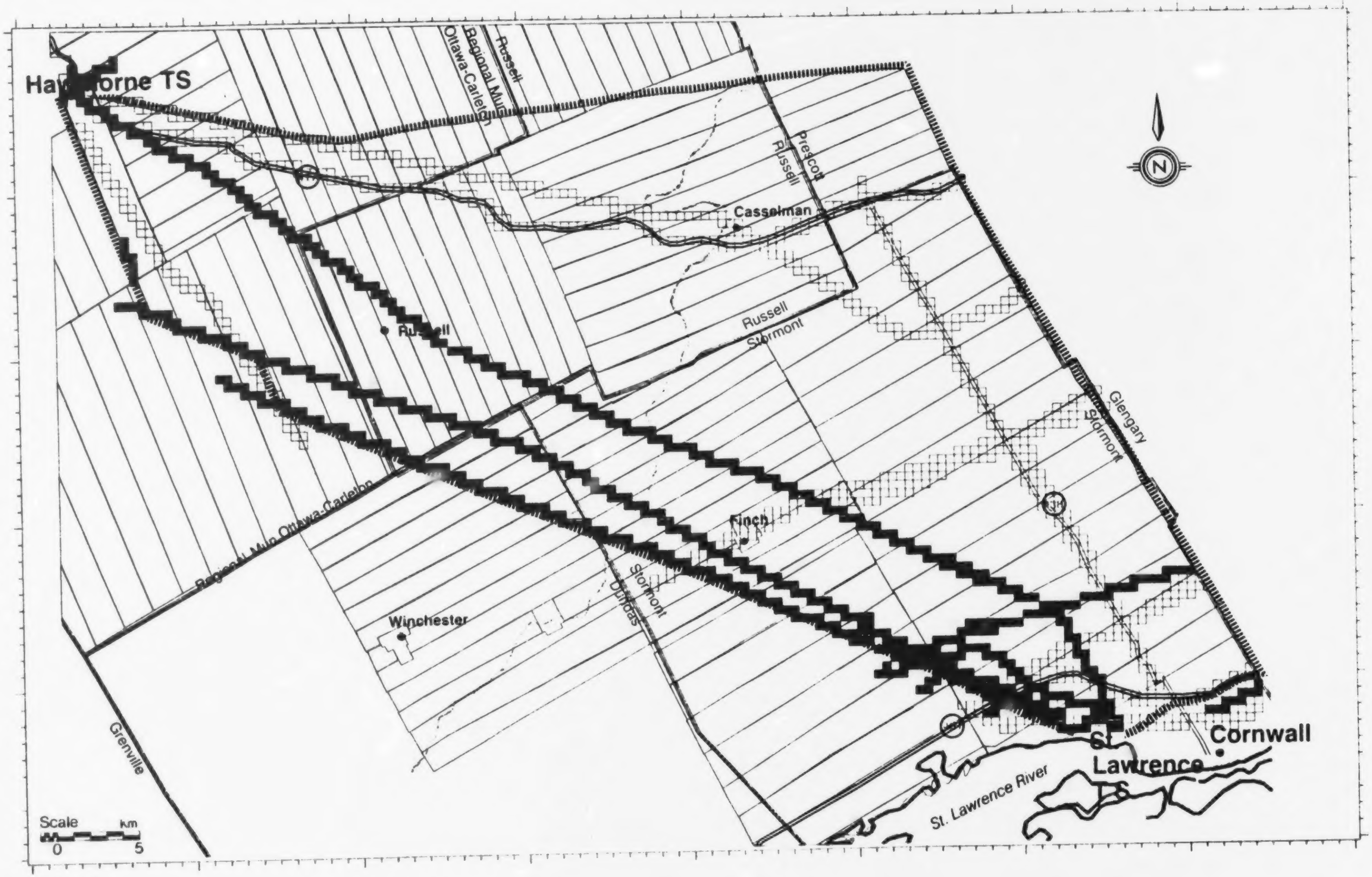
Corridor ABCDE (the Highway 417 Corridor) had sufficient width to allow for the location of a route on either side of the highway, while at the same time avoiding existing and proposed industrial and commercial development at most of the interchanges.

Corridor ABHINOR (the 230 kV line corridor) was developed to parallel the existing 230 kV transmission line from Hawthorne TS to St. Lawrence TS. This alignment provided the most direct route between the terminal points.

Corridor FGLMPR (the 115 kV corridor) was developed to follow an existing 115 kV transmission line because the existing line could be replaced by the 500 kV transmission line for approximately 70 percent of its length.

Corridor AF was located to link Hawthorne TS with the 115 kV corridor northwest of Metcalfe. This corridor was wider than most because of the diversity of land uses, thereby necessitating greater flexibility in locating a route. It parallelled the property fabric and allowed maximum use of lot and concession lines for locating a route.

Corridor BG provided an alternative to AF to link the Highway 417 corridor with the 115 kV corridor to maximize the potential to use the rebuild of the 115 kV transmission


Hawthorne TS
Russell
Regional Mun
Ottawa-Carleton
Prescott
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Casselman
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Glengary
Stormont
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Winchester
Stormont
Dundas
Regional Mun Ottawa-Carleton
Grenville
Cornwall
St. Lawrence
TS
St. Lawrence River
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Figure 4.4.
Suitability Map – ERCON

Legend

IIIIIIIIII	Study Area Boundary	┬┬┬┬┬	Existing Severances (Railway, Gas & Oil, Pipelines etc.)
TS	Transformer Station	—	Concession Lines
═	Highways		
▬	Existing Transmission Lines		

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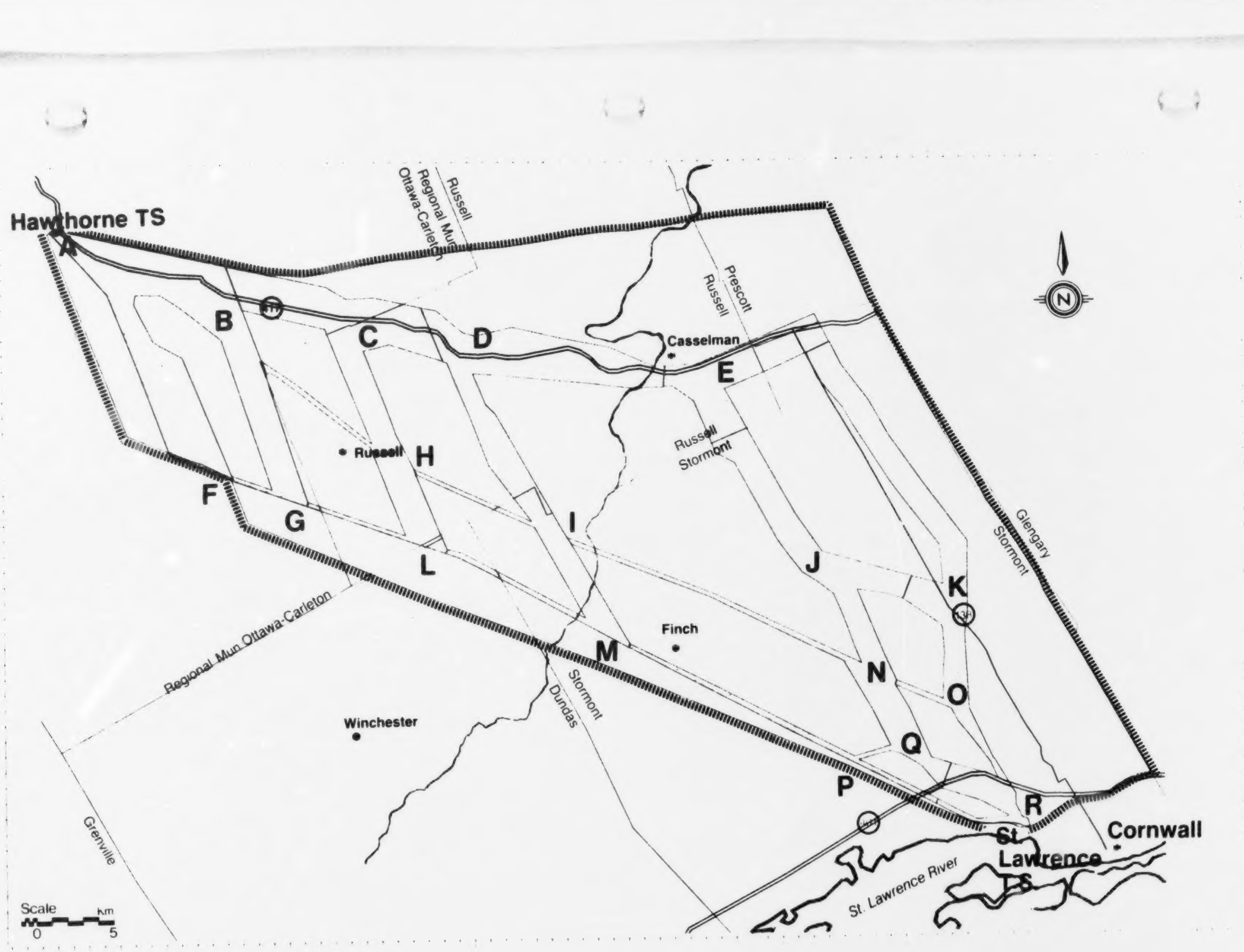
TABLE 4.5

Corridor Identification Guidelines

- Alternative corridors should follow the fabric of the land (lot and concession pattern).
- Alternative corridors should be located to avoid relatively higher environmental constraint areas wherever possible.
- Alternative corridors should be located in areas of low environmental diversity.
- Alternative corridors should be located to reflect the overall committee rating of objectives.
- Alternative corridors should be located to minimize the length of line and the number of turning structures required.
- Alternative corridors should be located with regard for officially stated or approved land use policies or regulations.
- Alternative corridors should be located to avoid, if possible, exclusion zones around the licenced airports, Department of National Defence and other telecommunications facilities.
- Alternative corridors should be approximately 1,500 metres wide in areas where there are no existing transmission lines, and approximately 500 metres wide when paralleling an existing transmission line.


Hawthorne TS
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Regional Mun Ottawa-Carleton
Stormont
Dundas
Grenville
St. Lawrence River
St. Lawrence TS
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Figure 4.5
Alternative Corridors – EREC2

Legend

▮▮▮▮▮▮▮▮	Study Area Boundary
TS	Transformer Station
▭	Alternative Corridors

line. It parallelled the property fabric in the City of Gloucester to maximize the use of concession lines for potential routes and provide for a mid-concession location in Osgoode Township on active agricultural land.

Corridor CHL was developed as a north-south link following property fabric between the Highway 417, 230 kV and 115 kV transmission line corridors.

Corridor DIM provided a link between the Highway 417, 230 kV, and 115 kV transmission line corridors by following the property fabric, while avoiding residential concentrations.

Corridor EJNQ was located to provide a north-south link between the Highway 417 and the 230 kV alternatives. It did not extend to the 115 kV corridor, but intersected with corridor PQQ_1R. The PQQ_1R corridor consisted of an existing Ontario Hydro owned right of way which could accommodate the 500 kV line with a small (4.6 m) widening. The corridor parallelled the property fabric for most of its length.

Corridor EKOR was located to minimize effects on agricultural land. Section OR parallelled an Ontario Hydro right of way which accommodates two existing 230 kV transmission lines.

The remaining corridor section, JK, provided an alternative between corridors EJNQ and EKOR to avoid a large wetland area.

4.7 Public Review of Corridors

On March 11, 1983, an introductory letter and Bulletin #2 were mailed to people on the mailing list. The Bulletin explained the study status and contained a map showing the location of the alternative corridors and a schedule of MPCs. Advertisements promoting the centres were placed in local newspapers and contacts were made with representatives of the media.

On March 28, 1983, the Regional Committee met to review the corridors. The committee generally agreed with the alternative corridor locations and requested that Ontario Hydro keep them up to date on progress toward the identification of alternative routes (Appendix C1.3).

A series of 11 MPCs were held during March and April, 1983 to review the corridors. Study information, maps and aerial mosaics were displayed and Ontario Hydro staff attended the centres to answer questions and assist the public in their introduction to, and review of, the materials. Comment forms were available to document public concerns and suggestions (Appendix C2.3 contains a copy of the form). Each MPC was open to the public from 7:00 pm to 10:00 pm with an earlier session scheduled for municipal staff and council members. Council members were encouraged to remain during the evening session. Throughout the five week MPC schedule, approximately 700 people attended the 11 centres. Information was recorded on aerial mosaics and maps displayed at each centre. Specific locational concerns of individual property owners were identified, as well as general issues not specifically related to the location of routes. Appendix C2.1 summarizes the main comments received at each of the centres.

Municipal positions pertaining to the Route Stage study, which were passed on to Ontario Hydro, are summarized in Appendix C3.

Generally, the concerns expressed by the public related to the effect of transmission lines on agricultural land. In addition there was support for minimizing new rights of way and avoiding areas of human settlement. The questions most frequently asked by the public related to:

- property acquisition policies and compensation on agricultural land;
- use of narrow-base lattice towers on prime agricultural land;
- electrical effects on television and radio reception; and
- effects of construction on prime agricultural land and tile drainage.

Following the MPCs, Ontario Hydro analyzed the public comments received and followed up through personal contact on correspondence from individual property owners. Names of those attending the centres and those who phoned or wrote to Ontario Hydro were added to the study mailing list.

5.0 ALTERNATIVE ROUTE DEVELOPMENT

5.1 General

Once corridors were identified and reviewed by the public, the next step involved locating a route within each corridor. Each route represented the location considered most suitable for the proposed transmission line within its corridor.

Each route was identified based on land use and environmental information collected and mapped on 1:15,000 scale air photo mosaics. The data types were similar to those used to develop corridors. The reduced area being studied and the smaller map scale allowed smaller features to be mapped, for example, individual buildings rather than concentrations of buildings.

The location of each route was also based on social and technical information and considered comments received from the public, Regional Committee members, and government representatives.

5.2 Route Step Data Collection

5.2.1 Land Use and Environment

The information gathered at the corridor step was reviewed and some data were updated and re-mapped at the 1:15,000 scale. New information was also collected and mapped to assist in the location of alternative routes.

The new land use and environmental data were collected within and near all corridors and mapped at a scale of 1:15,000. In total, 45 data types were inventoried and were presented on a series of air photo mosaic base maps according to each of the nine factors.

New aerial photography at a scale of 1:12,000 was obtained during the spring of 1984. The stereo pairs were used to update data on the 1:15,000 scale air photo mosaic.

5.2.1.1 Factors and Data Types

The purposes of the route step data collection were two-fold:

- to provide an inventory of information as a guide for route identification in order to minimize potential effects on the environment;
- to provide the information necessary to evaluate and compare the route alternatives.

Although most data were collected concurrently, not all data were used for both the alternative route identification and evaluation. Some information was used only for evaluation purposes because these features could not be avoided; but knowledge about them was important for a complete understanding of the potential effects associated with an alternative. Cultural landscapes and viewsheds of settlements are examples of these types of information. Finally, there were data that could only be collected after the routes had been identified. This applied specifically to the viewsheds of the alternative routes and the number of houses either within the viewsheds or in proximity to the route.

The data types inventoried for each factor are identified below. A short discussion of how the data were used is included with each.

(i) Agricultural Resources: Four data types were collected for this factor. Agricultural land use patterns were mapped on a field by field basis and were evaluated based on the following data:

- Area of tower base in grain or forage crops;
- Land in tile drainage;
- Area of tower base in pasture land; and
- Length of agricultural land crossed.

In locating alternative routes, an effort was made to avoid lands in grain or forage crops and market gardening. Areas of tile drainage were identified to assist in the location of intensively farmed land.

(ii) Appearance of the Landscape: Five data maps were prepared for this factor. The landscape maps originally prepared for the corridor step were used again for the route step. The evaluation of potential visual effects was based on:

- Landscape types crossed
  - natural
  - flat, untreed farm land
  - rolling farm land (fields and woodlots)
  - abandoned farm land
  - urban;
- Number of crests affected;
- Number of long views;
- Number of road crossings; and
- Number of homes within the primary viewshed of the proposed alternatives (maximum 2 km either side).

The visual data types were primarily used in route evaluations because of the predominantly flat open landscapes which would have the potential to make the line easily visible throughout the study area.

(iii) Biological Resources: Six data types were collected for this factor. The biological data collected for the route step consisted of corridor step information and an assessment of habitat potential. Habitat potential was defined using a model, developed by Ontario Hydro, based on the Ontario Forest Resources Inventory (FRI) at a scale of 1:10,000. This model integrated woodlot size, cover type, cover diversity, and maturity to predict habitat potential. Another model was used to classify wetlands. The biological evaluation was based on the following:

- sensitive/significant biological areas;
- deer concentration areas;
- primary upland wildlife habitat;
- secondary upland wildlife habitat;
- wetlands with high, medium or low biological value;
- number of vegetated stream/river crossings.

All the biological data types were used to identify routes except for the vegetated stream crossings which traversed the corridors and could not be avoided by the alternative routes.

(iv) Forest Resources: This factor had four data types collected for the route step. The forest resources considered management inputs (such as sugar bushes and Woodlot Improvement Act Agreement forests), maturity of forest stands and plantations, forest types (that is, upland or lowland hardwoods, pioneer hardwoods or conifers) and the FRI site classes. The forest resources were evaluated based on the following:

- Areas of sugar bush or semi-mature upland hardwood stands (FRI site classes 1 or 2);
- Area of forest management (young and semi-mature), mature/semi-mature upland hardwoods (FRI site classes 3 or 4) and semi-mature conifer and mature lowland hardwood stands (FRI sites classes 1 or 2);
- Area of forest management (new growth), young/immature upland hardwoods, mature lowland hardwoods (FRI site classes 3 or 4) and semi-mature conifer stands (FRI sites classes 3 or 4); and
- Area of young pioneer hardwoods, conifers or lowland hardwood or mature conifer or scattered stands.

All four data types were used to determine the total amount of forest cover that would be affected along each route.

(v) Heritage Resources: Three data types were collected for this factor. The historic cultural landscapes were mapped in conjunction with the landscape units identified for the Appearance of the Landscape. These cultural landscapes were centred around historic sites, such as log or limestone buildings, and recognized a historic cultural landscape in terms of the historic features and its physical characteristics. The archaeological Heritage

Resources data types were re-mapped from corridor step data. Heritage Resources were evaluated based on the following:

- length of route crossing historical cultural landscapes;
- number of known archaeological sites; and
- area of reported but unsubstantiated archaeological significance or area of potential for archaeological sites.

The data on historic features were used for both route identification and evaluation. No known archaeological sites had been identified within any of the corridors. Archaeological potential was not used in route identification because its significance was unknown and generally covered broad areas of the alternative corridors.

(vi) Human Settlement: Seven data types were collected for this factor. The potential effects on human settlements were evaluated based on:

- number of permanent residential buildings;
  - removals
  - in proximity
- number of farm complexes;
  - removals
  - in proximity
- number of farm outbuildings;
  - removals
- number of institutional, commercial or industrial facilities;
  - removals
  - in proximity
- number of proposed industrial developments directly affected;
- number of proposed residential developments directly affected;
- number of properties affected

During route identification an effort was made to avoid all buildings and existing developments. The buildings that were counted as removals were located adjacent to existing transmission lines where the route could not avoid them. The number of properties affected was used primarily for evaluation rather than for route identification.

(vii) Mineral Resources: Five data types were mapped for this factor. The Mineral Resources Factor was comprised of corridor step data that were updated, checked for accuracy and re-mapped. All information on mineral resources was obtained from government and industry contacts. Geologic information was obtained from the literature cited in Appendix B1. The mineral resources were evaluated based on the following:

- licenced pits;
    - length crossed
    - number crossed
- licenced quarries
    - length crossed
    - number crossed
- area of high aggregate potential;
    - granular 'A' crushed
    - asphalt or concrete blending sand
    - granular 'B' or 'C'

All the Mineral Resources data types were used for both the route identification and evaluation.

(viii) Recreation Resources: Four data types were collected and mapped for this factor. The data types were comprised of corridor step data, which were refined to the route step scale, and an update of existing and proposed recreational facilities. The re-mapped corridor step data included existing recreational sites and foot trails. Recreational data collected for the route step included: the viewsheds of private campgrounds, public parks, foot trails, and parks/conservation areas. The potential effects on recreation were evaluated based on:

- number of recreational sites crossed;
- length within viewsheds of private campgrounds;
- length within the viewsheds of public parks; and
- length within the viewsheds of foot trails.

The concern was to avoid the features themselves, and then the viewsheds were considered.

5.2.2 Socio-Economic

To provide a perspective on the socio-economic environment and to supplement information obtained from the MPCs, certain data were collected on a township basis. To better define each township's orientation to development, discussions were held with planners from the Community Planning Advisory Branch of the Ministry of Municipal Affairs and Housing. These discussions related to the type and amount of development, new development proposals, and current planning problems. The 1981 financial statements of each township were reviewed to determine the percent of the taxable assessment which was commercial, industrial and business.

Resource economic data were collected, where possible, on a township basis. This 1981 data included: value of agricultural sales, value of sales of forest products and sugar maple products, and total capital value of farms. Per capita assessments by township were also reviewed. These data were used as gross indicators of economic activity.

5.2.3 Technical

The facilities which could be affected by the operation of a 500 kV transmission line were identified and mapped.

These facilities included licenced airports, navigation aids, major gas and oil pipelines, railway lines, AM radio broadcast stations, cable TV and FM radio head-ends, and other communication facilities, such as the Department of National Defense Base at Leitrim.

In each case identified, the nature of the impact was analyzed and the owner of the facility was contacted if an adverse effect was possible. After discussion with the owner, a decision was made on the severity of the impact and how it influenced the location of the alternative routes.

5.2.3.1 Licenced Airports

No licenced airports were located within the corridors. Ottawa International and the Russell Airports were near two of the corridors. Transport Canada was contacted and it was determined that there would be no conflict with height restriction regulations around Ottawa International Airport; however, at the Russell Airport the route location within corridor CH would be influenced by height restrictions to protect the airport licence.

Transport Canada, Telecommunications and Electronics Division advised that an approach control device for Ottawa International Airport is located within corridor AF. Ontario Hydro agreed to locate the route in this corridor with as much separation as possible from this site. Also, it was agreed that a review of electromagnetic interference effects of the transmission line on this site would be made after the alternative routes had been located.

5.2.3.2 Existing Linear Facilities

Two existing Ontario Hydro transmission line rights of way and Provincial Highway 417 were considered in identifying the location of a number of the alternative routes. The existing transmission lines for the most part are on easement rights only. Since the land is not owned by Ontario Hydro, the existing easements would have to be re-acquired to accommodate the new 500 kV line.

A number of both operating and abandoned railway line severances and a pipeline right of way were considered in the location of the alternative routes. None of the operating rail lines were wide enough to accommodate a 500 kV transmission line, however; in some locations it was advantageous to parallel the existing severance through an otherwise uniform area. The abandoned railway did not provide a suitable alternative route since it meandered through numerous villages with residences adjacent to it and would have required significant widening to accommodate a 500 kV transmission line. Similarly, the pipeline right of way did not provide a suitable alternative route because of conflicts with both the pipeline facilities and residences adjacent to the right of way.

5.2.3.3 Cost Considerations

The cost of constructing a transmission line is affected by a number of factors, including:

- the specific tower design;

- the length of line and the number of angles or turns in the line;

- the clearing of the right of way and the impact of soil conditions on the construction of access roads, tower foundations, and tower assembly;

- the use of special construction practices and mitigation measures;

- the removal and replacement of an existing line with a new line capable of accommodating both the existing line and the proposed 500 kV line, while maintaining adequate service to the customers in the area; and

- the cost to acquire the property rights.

The cost varies with the type of tower used and with the number of angles or turns in the line; at angles heavier and more costly towers are required. Where open field conditions exist in Class 1 to 4 agricultural land, the policy of constructing narrow base lattice towers will apply.

The approximate cost of constructing a kilometre of new single circuit 500 kV transmission line, using standard wide base towers, is about $504,000. The comparable cost for narrow base towers is $614,000 per kilometre. Dual voltage (1-cct 500 kV and 1-cct 230 kV) transmission line, which involves the removal of an existing line, is estimated to cost about $680,000 per kilometre. These estimates are in 1984 dollars and assumed stable soil conditions, a typical mix of suspension and angle towers, and excluded survey and property costs. In identifying alternative routes, it was therefore important to recognize the significant effect that additional transmission line length and line configuration could have on total cost.

As soil conditions become wetter and less stable, the cost of line construction increases significantly. For example, the cost of constructing tower foundations in deep marine clay may be up to twice that in an area of stable soils. The cost of providing access to tower sites also increases in areas of unfavourable soil conditions. Other factors which increase construction costs because of the need for special construction practices are areas such as tile drained fields and dense tree cover.

5.2.4 Public Involvement

The following sources were used to collect information from the public to assist in identifying alternative routes within the corridors:

- public comment forms;
- reports from March, 1983 MPCs to review alternative corridors;
- committee member correspondence;

- correspondence, telephone calls and meetings with residents; and
- municipal correspondence.

The comments from the 220 comment forms received at the MPCs were coded and analyzed. Based on the frequency of response, the major concerns reported on the comment forms were:

- to avoid prime agricultural land
- to following existing rights of way
- to avoid use of improved land
- to avoid private homes and property, and
- to use "wasteland"

In addition, specific locational information was provided by residents who either attended the MPCs or wrote letters or telephoned0

5.3 Location of Alternative Routes

5.3.1 Description of Process to Locate Routes

Alternative routes were identified by Ontario Hydro on 1:15,000 scale air photo mosaic base maps which showed the environmental information. In addition, guidelines similar to Table 4.5, topographic maps, property assessment maps, and information supplied by the public at the MPCs, in letters and comment forms were used to identify alternative routes.

In the corridors following existing transmission lines, in some locations the existing transmission line could be removed and replaced with the new 500 kV line. Other locations where the existing lines had a future use, the environmental and engineering information were reviewed to select the preferred side of the existing line for paralleling with the new 500 kV line. In corridors where no transmission lines existed, a route was located to minimize the effects on the environment, effects to landowners and their use of the land, interference with communications facilities, and cost.

5.3.2 Rationale for Eliminating Some Alternative Corridors

A preliminary evaluation was completed to determine which corridors should be retained for continued study and public review. As a result of this preliminary evaluation, the corridors ABHIN, CHL, DIM and JK were eliminated from further study.

The corridor ABHIN followed the existing 230 kV transmission line from Hawthorne TS to St. Lawrence TS. This transmission line is one of the critical bulk power transmission lines supplying the Ottawa area and therefore, cannot be considered for consolidation with the proposed new 500 kV transmission line because of system security reasons. The only alternative along this corridor would have been to parallel the existing transmission line with the new line on separate towers.

For the most part, the existing 230 kV transmission line is located in high quality farm land on a 36 metre wide easement diagonal to the property fabric. A new 500 kV transmission line parallel to this line, while it would have the advantage of overlapping the existing line easement to some extent, would still result in an additional right of way requirement of approximately 47 metres. The disadvantages for using corridor ABHIN included the following considerations:

- second line of towers in high quality farm land would remove more land from production and result in additional towers in mid-field locations affecting machinery manouverability; and

- farm buildings, individual residences, and other buildings would be directly affected requiring their removal.

A new line parallel to the existing transmission line is a significantly less favourable alternative then replacing the existing 115 kV transmission line located a few kilometres to the south.

Both corridors CHL and DIM were links which were originally included to allow for connections between the Highway 417 corridor and the 230 kV and 115 kV transmission line corridors. These corridors were included to provide alternatives for by-passing specific areas of conflict with existing development along the 230 kV transmission line corridor. Since the 230 kV corridor ABHIN was removed from further study, the need for CHL and DIM became less important. The disadvantages of corridor CHL were that it was in proximity to Russell Airport, had potential conflicts with development along the Castor River between Russell and Embrun, and affected high quality agricultural land. The disadvantages of corridor DIM included the potential for restricting operations at the St. Albert Quarry and it crossed an area of high quality agricultural land for the majority of its length. Also, both corridors did not maximize the replacement of the 115 kV transmission line east of the Village of Kenmore to Lunenburg Junction near Cornwall.

Corridor JK would have resulted in a new easement which provided no land use or environmental advantage over JNO which crossed a comparable environment and parallelled an existing right of way along NO.

5.4 Description of Alternative Routes

The following is a summary of the alternative routes. The detailed location information and location rationale are presented in Appendix B8. The location of the alternative routes is shown on Figure 5.1.

All routes follow a common link east from Hawthorne TS crossing Highway 417 parallel to the Canadian National Railway (CNR) line to point A. The area east of the highway is actively farmed. It is owned by the federal government and administered by the National Capital Commission (NCC) as part of the Greenbelt.

The Highway 417 alternative ABE parallels the south side of the CNR line in active farm land from points A to B. From point B to E this alternative generally parallels Highway 417 through forested land leaving a screen of trees. It avoids residential and commercial developments near Vars, Limoges, and Casselman. In this area, the route follows the property fabric through active farm land. The South Nation River and the Castor River crossings were located to allow placement of towers well back from the river banks.

The 115 kV alternative F and G parallels the northernmost 115 kV right of way to Russell DS in order to reduce right of way requirement on active farm land and near residences. From Russell DS to point P, the existing line could be removed and the new line constructed on the existing right of way which would be widened to 65 metres. Although diagonally crossing active farm land, use of the existing right of way minimizes the amount of new easement required and reduces the majority of direct environmental effects. From point P to the St. Lawrence TS, the alternative parellels the existing line, sub-route PP_1R on the north side of the existing transmission line.

The northern portion of sub-route AFG is located on federal government land which is part of the National Capital Commission Greenbelt. This area is largely undeveloped with limited areas of agriculture. Small residential properties are located along the concession roads which are crossed by the sub-route. After leaving the Greenbelt area, the sub-route crosses a short segment of agricultural land. This sub-route crosses the rear portion of one golf course and follows the back lot line of a second golf course farther south. The southern portion of the sub-route is located in a rocky, wooded area where there is estate residential development at the intersecting east-west concession roads. From point F to G, the sub-route follows the existing 115 kV transmission line through active agricultural land and areas of proposed lot estate residential developments.

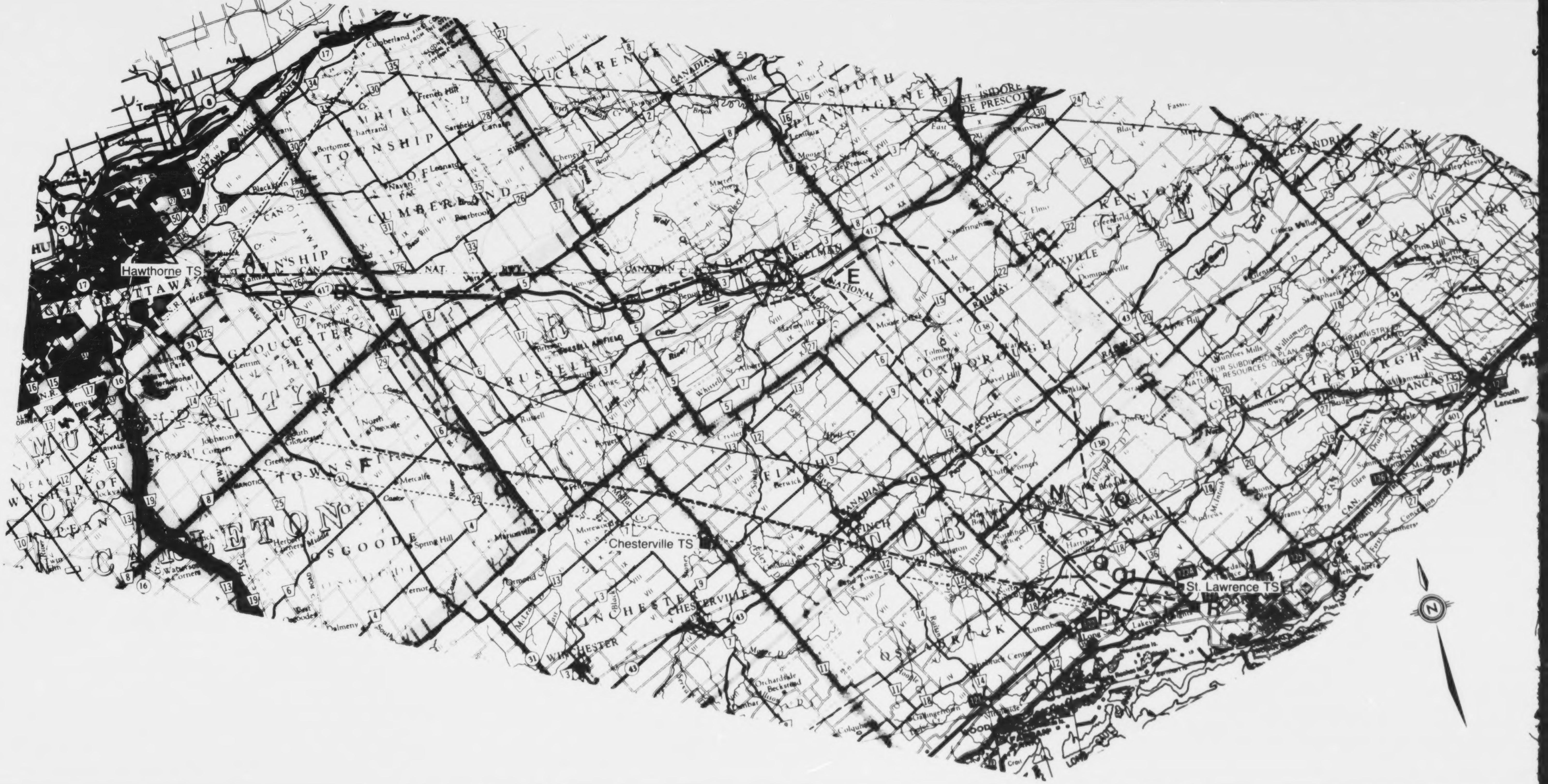
The northern portion of sub-route ABG is also located on federal government land which is part of the NCC Greenbelt. This area is predominantly forested in the north and from Edwards to point G the sub-route runs primarily on back lot lines to minimize effects on active farm land. It then crosses the North Castor River and parallels its southern bank in order to follow another property line to point G. In this fashion, the sub-route avoids residences and effects only the edge of the few scattered woodlots in the area.

Sub-route ENQ Q_1R parallels the western side of the Moose Creek Bog, after which it crossed predominantly active agricultural land, interspersed with areas of forested land. Near point N the sub-route crossed the Newington Bog and follows the lot line between lots 31 and 32 in Cornwall Township. Small residential properties are located on the concession roads crossed by the sub-route. The sub-route was aligned: to take advantage of the forest-agriculture interface at the Moose Creek Bog; to run with the property fabric through areas of active farm land; to take advantage of a narrow crossing of the Newington Bog; and, to make use of the owned Ontario Hydro right of way in the QQ_1R portion.

Sub-route EOR follows the agriculture-forest interface at the north end of the Moose Creek Bog and crosses active agricultural land to reach Tayside, at which point it is aligned with the property fabric avoiding residences and passing through active agriculture, forest land, and gravel deposits until reaching Monkland. From Monkland to point O, the sub-route avoids existing residences and planned estate development. It crosses diagonal to the property fabric through forest land with a minor amount of agricultural activity.

Sub-route PQQ_1R parallels an existing 230 kV line right of way. From point P to County Road 18, the sub-route is located on the north side of the existing line easement. From County Road 18 to point R, the sub-route is located on the south side of the existing transmission line on property owned by Ontario Hydro. South of County Road 18, the sub-route is located predominantly on forested land with small pockets of active agriculture.

From point P_1 to Q_1 the route parallels the south side of Highway 401 through undeveloped forest land. This provides a link between the 115 kV alternative and the PQQ_1R sub-route to avoid residential developments and two sanitary landfill sites on P_1R.



Hawthorne TS
Chesterville TS
St. Lawrence TS
CITY OF OTTAWA
TOWNSHIP OF CUMBERLAND
CLARENCE
SOUTH PLANTAGENET
ST. ISIDORE DE PRESCOTT
GLOUCESTER
OSGOODE
RUSSELL
CASSELMAN
ROXBOROUGH
KENYON
MAXVILLE
CHARLOTTENBURGH
LANCASTER
WINCHESTER
CHESTERVILLE
FINCH
OSNABRUCK
CUMBERLAND
Metcalfe
N

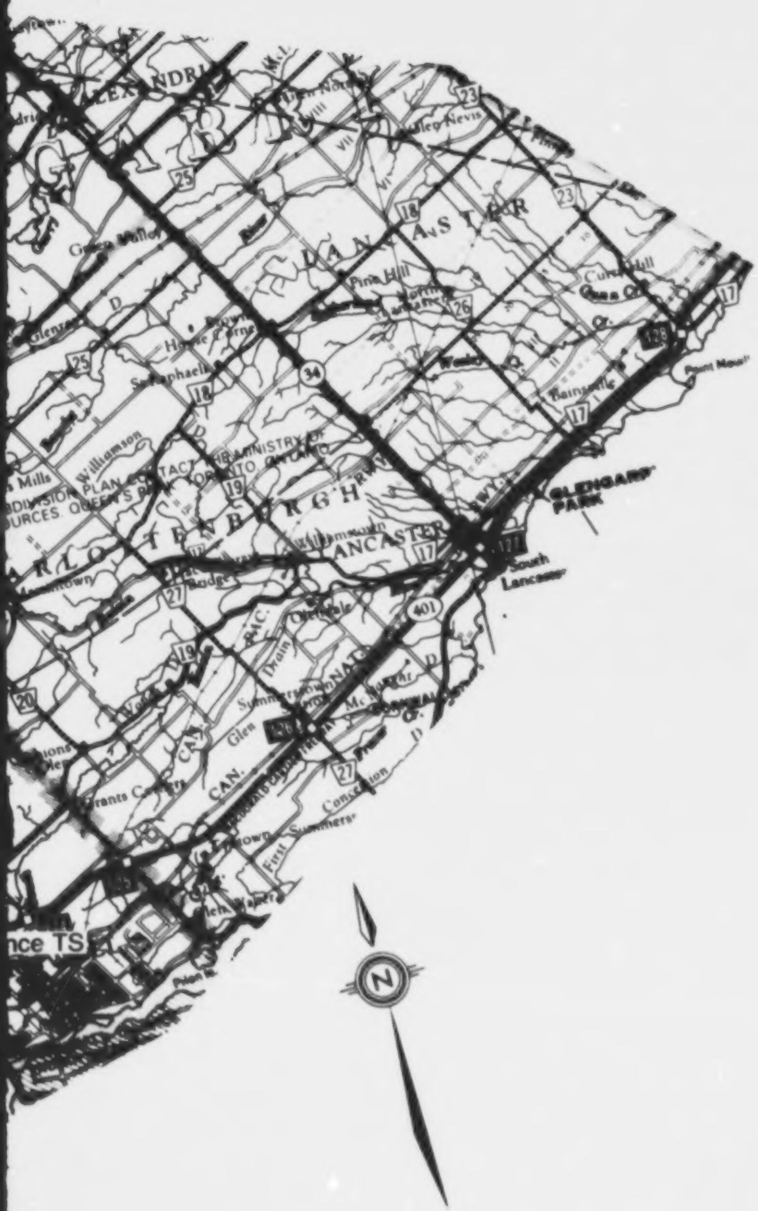

ALEXANDRIA
Glen Nevis
Green Valley
LANCASTER
Pine Hill
Curry Hill
Bainsville
Point Mouillee
GLENGARRY PARK
South Lancaster
CHARLOTTENBURGH
Williamstown
ANCASTER
Summerstown
Glen
Concession
Grants Corners
nce TS
Williamson
N
401
17
34
18
19
23
25
26
27

Figure 5.1
Alternative Routes

Legend

- ——	Existing 230 kV Line
-------	Existing 115 kV Line
■	Transformer Station TS
·----	Alternative Routes
A	Route Intersection

Note: Alternative routes are not drawn to scale
All boundaries are approximate

MF Roll No	Rev	Date	Particulars	Drawn	App'd

Ontario Hydro
Design and Development Division - Transmission

Drawn by K. Kolyn	Supervising Planner
Date March 1985	Supervising Project Engineer
Work Order 840-03016	Graphics Prod. Supervisor D. Henderson

Scale	Drawing No	Rev	Sheet
1:250,000	RS170-LUEP-RA6-0050	0	1 of 1

Between points N to O the route parallels the existing 230 kV line on the north side to reduce the amount of new right of way required and crosses predominantly forested land avoiding residences.

5.5 Public Review of Alternative Routes

All properties, within the corridors where alternative routes had been located, were identified. Where a route was located outside a corridor, the properties within 120 metres of the route were also identified. Ministry of Revenue assessment maps were used to identify the properties and obtain the corresponding assessment roll numbers. Names and addresses for those roll numbers were then obtained from Ministry of Revenue for use as a study mailing list.

Where additional information or clarification of property ownership was necessary, local assessment offices and municipalities were contacted. Wherever possible, names and addresses of tenants were also added to the mailing list. Approximately 2,800 names were collected in this manner. These names were added to the existing study mailing list of some 1,200 interested residents and organizations.

On August 21, 1984 the Regional Committee met to review the alternative routes. The committee generally agreed with the alternative route locations. The committee members agreed to review the alternative routes with the organizations which they represented. A meeting was scheduled for October 11, 1984 to receive comments of the committee members after the conclusion of the second series of MPCs.

On August 22, 1984 a study Bulletin was mailed to approximately 4,000 people now on the study mailing list. The Bulletin explained the study status and contained a map showing the location of the alternative routes. A schedule of the upcoming municipal participation centres and a telephone number to call for further information were also provided.

On August 23, 1984 a press conference was held in Winchester to brief the local media on the study, the identification of the alternative routes and the schedule of MPCs.

Advertisements promoting the centres were placed in local newspapers and additional contact with print and electronic media generated additional reports.

The second series of MPCs incorporating the twelve potentially affected municipalities was held from September 5-18 1984 to present and discuss the alternative routes with local residents and to obtain detailed locational information and their comments. Study information, maps and aerial mosaics were displayed and Ontario Hydro staff answered questions and assisted residents in their introduction to, and review of, the materials. Comment forms were available to document public concerns and suggestions (Appendix C2.3). Each MPC was open from 3:00-5:00 and 7:00-9:00 pm with a 6:30 pm preview session for municipal councils and staff. Council members were encouraged to remain for the evening session.

Throughout the three week schedule, approximately 600 people attended the MPCs. Specific locational concerns of individual property owners were identified, as well as general issues not specifically related to the routes. Appendix C2.2 summarizes the attendance and key comments at each of the eight MPCs.

Municipal positions pertaining to the alternative routes, which were forwarded to Ontario Hydro, are summarized in Appendix C3.

On October 11th, the Regional Committee met again and members provided specific comments on the alternative routes from their representative organizations. Most members indicated that the 115 kV alternative seemed to be the reasonable choice.

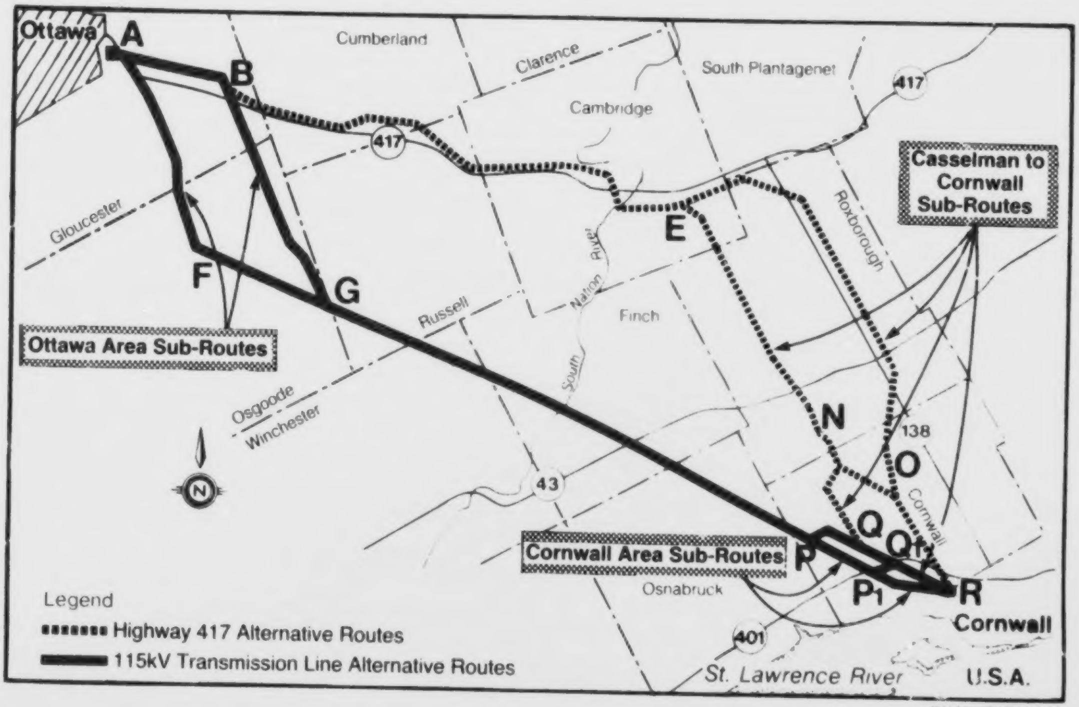
Approximately 50 telephone calls and 40 letters were received during September and October, 1984. These, along with the notes made from meetings, other conversations with local residents, and a review of comment forms, indicated concerns which focussed on the effect of a line on agricultural land. The most frequently expressed comments were:

- effects of transmission line construction and operation to agricultural operations if towers are located in cultivated fields;
- use of narrow base lattice towers on agricultural land;
- impact on property values by the presence of a high voltage line;
- property acquisition policies and compensation of affected owners;
- possible effects on radio, TV reception and electronic farm equipment;
- electrical effects of high voltage lines; and
- public hearings and government approval process.

6.0 EVALUATION AND COMPARISON OF ALTERNATIVE ROUTES

6.1 General

The next step in the planning process involved the evaluation and comparison of the alternative routes between Hawthorne TS and St. Lawrence TS. The land use, environmental, cost, technical and socio-economic information which was used in the evaluation of the alternative routes is provided in this Chapter. Detailed locational information and comments received during the public review of alternative routes were reviewed and all new information was either added to the evaluation information or was used as a check on the Ontario Hydro assessment of the relative importance of the information.



Ottawa
A
B
Cumberland
Clarence
South Plantagenet
417
Cambridge
417
Casselman to Cornwall Sub-Routes
Gloucester
E
Roxborough
Nation River
South
F
G
Russell
Finch
Ottawa Area Sub-Routes
Osgoode
Winchester
N
138
O
N
43
Cornwall
Q
Q1
Cornwall Area Sub-Routes
P
P1
R
Osnabruck
Cornwall
Legend
▪▪▪▪▪▪▪ Highway 417 Alternative Routes
▬▬ 115kV Transmission Line Alternative Routes
401
St. Lawrence River
U.S.A.

Figure 6.1
Alternative Route Evaluation Process

The process for selecting the route preferred by Ontario Hydro involved evaluating a number of sub-routes in the three areas shown on Figure 6.1. In each of these three areas one sub-route was selected to make up one of the two alternative routes between Hawthorne TS and St. Lawrence TS. These two alternative routes were referred to as the Highway 417 route and the 115 kV transmission line route.

Chapter 6 provides the information that was used to evaluate, compare and select the preferred sub-routes (Section 6.3) and also the information used to evaluate and compare the Highway 417 route with the 115 kV transmission line route (Section 6.4). The rationale for selecting the recommended route is presented in Chapter 7.

6.1.1 Land Use and Environment

The land use and environmental evaluation was comprised of two distinct components. First, the magnitude of the potential effects resulting from each route link was determined. The numerical measurements were then aggregated, by respective data type, for each sub-route and tabulated. Second, the significance of the potential effects was described in order to put the predicted environmental changes in perspective. This approach allowed for the consideration of information that could be measured and expressed numerically as well as for information that was not quantifiable or was more effectively expressed in qualitative terms.

The comparison of the advantages and disadvantages among the sub-routes was based on consideration of both the quantitative and qualitative components. The quantitative analysis served to highlight the range of relative differences among the potential effects for each sub-route. The qualitative analysis described the key issues or environmental problems, and outlined other information, such as mitigation measures, that could minimize potential effects.

6.1.2 Socio-Economic

Four criteria were developed to evaluate and compare the socio-economic effects of a new transmission line. These criteria were based on the results of a literature review of socio-economic effects of transmission lines, knowledge of the study area, and analysis of concerns expressed at the MPCs. The criteria are as follows:

- ability to handle change;
- compatibility with the community;
- economic base change;
- social/lifestyle change.

Additional information on the criteria is contained in Appendix B6.5.

The evaluation of the potential socio-economic effects cannot meaningfully be described in absolute terms. The evaluation of socio-economic effects is only valid in a relative sense. For that reason, the discussion is provided on a comparative basis with the relative merits of the route alternatives highlighted. Quantitative support data are presented in Appendix B6.6.

6.1.3 Cost/Technical

Cost estimates were prepared for each link. The cost estimates included capital costs of materials, labour, property, engineering, survey and overhead and are in present worth 1985 dollars based on the transmission line being in-service on November 1990. The link cost estimates were prepared such that they could be added together to arrive at a total estimated cost for any combination of links to form a sub-route or a complete alternative route from Hawthorne TS to St. Lawrence TS.

The cost estimates assumed the use of the standard wide base lattice towers throughout. The use of narrow base towers in Class 1 to 4 active agricultural land would have the effect of increasing the cost of each link in direct proportion to the length of route crossing active agricultural land. This potential for increased cost is in the order of 8 to 9 percent for the Highway 417 route and 12 to 13 percent for the existing 115 kV transmission line route.

All of the alternative routes avoid areas of leda clay (sensitive marine clay) on slopes which are unstable and are susceptible to sudden and catastrophic failure. However, it was not possible to avoid all areas where the subsurface soil is leda clay 12 metres or more thick. Table 6.1 identifies the route links and shows the length of route which may require special foundations for towers.

TABLE 6.1

Areas of Leda Clay

Link	Length of Link (km)	Length of Link in Deep Leda Clay (km)
TSA	1.6	1.6
AB	8.9	8.9
AF	15.3	11.3
BG	16.4	10.6
BE	36.7	29.8
EO	33.5	5.2

The cost estimates shown in Tables 6.3, 6.4, 6.5 and 6.6 include the higher costs associated with building tower footings in deep leda clay.

6.1.4 Public Involvement

The following sources were used to collect information from the public to assist in evaluating the alternative routes:

- committee member comments;
- information received from September, 1984 MPCs to review alternative routes;
- public comment forms;
- letters, telephone calls;
- field visits and meetings; and
- information received during the review of alternative corridors.

Approximately 100 comment forms from the September, 1984 MPCs were completed by the public and returned to Ontario Hydro. These forms and other sources of information were analyzed and the following summarizes the suggestions offered for the selection of the recommended route:

- minimize disruption to prime agricultural and improved land;
- minimize disruption to homes and buildings;
- minimize effect on woodlots and forested areas;
- consider the cheapest and most direct alternative; and

- follow an existing right of way rather than a new severance because it seems to represent less new impact.

In addition, specific locational information was provided by people on their properties. Each route was assessed based on the degree to which it satisfied the suggestions provided by the public.

6.2 Existing Transmission Line Facilities

Existing transmission line rights of way were studied to determine the feasibility of:

- decommissioning and removing the existing lines;
- removing the existing lines and building the new line in their place;
- building beside an existing line to minimize new right of way requirement; and
- removing the existing lines and building the new line using special towers to combine both the existing line and the new 500 kV line on the same widened right of way.

All existing lines are now needed to maintain a reliable electrical supply in eastern Ontario. Upon completion of the first 500 kV line from Lennox GS to Hawthorne TS, it will be possible to remove from service the existing 115 kV transmission line between Russell distributing station (DS) near Kenmore and Lunenburg junction in Cornwall Township. The existing easement could be widened and the new 500 kV transmission line would be built to replace the existing 115 kV transmission line. The existing easement rights would have to be re-negotiated. No other transmission lines in the study area could be removed and replaced.

Some of the alternative routes (Table 6.2) considered building the new 500 kV line beside an existing transmission line. In each case the new line right of way would be overlapped with the existing right of way to minimize the total right of way required. New rights for the resulting easement would have to be acquired.

The alternative to rebuild the existing transmission lines using special towers to combine both new and existing was rejected because of the high cost of the combination towers and in some cases technical requirements. Consolidation with the existing 230 kV transmission line between St. Lawrence TS and Hawthorne TS was unacceptable for system security reasons.

Table 6.2 summarizes the route links which involved either replacement or paralleling with the 500 kV transmission line. The table also shows the approximate existing right of way widths on each route link.

TABLE 6.2

Existing Rights of Way (R/W)

Link	Existing R/W Width (m)	Approximate Additional R/W Width (m)	Alternative
FG	30	47	Build beside 115 kV line
GP	30	35	Replace 115 kV line
PP_1	30	47	Build beside 115 kV line
P_1R	30	47	Build beside 115 kV line
PQ	43	43	Build beside 230 kV line
QQ_1	75	12	Build beside 230 kV line
Q_1R	75	12	Build beside 230 kV line
NO	37	47	Build beside 230 kV line
OR	78	47	Build beside 230 kV line

6.3 Sub-Route Evaluation and Selection

6.3.1 Ottawa Area Sub-Routes
(ABG Versus AFG - Figure 6.2 and Table 6.3)

Both sub-routes include a short common portion between Hawthorne TS and point A. This common portion is included in the evaluation of both sub-routes.

Sub-route ABG crosses through predominantly flat agricultural land with some pockets of forest in the north portion while sub-route AFG primarily crosses through rolling treed land with estate lot development in the southern half. On sub-route AFG, the FG portion parallels the north side of an existing 115 kV transmission line while sub-route ABG is all new right of way.

Sub-route AFG is in proximity to a navigation aid for the Ottawa International Airport and a Department of National Defence (DND) military radio installation. Detailed studies would be undertaken if sub-route AFG were selected. Preliminary information from both Transport Canada and DND indicates that impact on the military radio installation should not be significant; however, the radio beacon used as an airport navigation aid would be relocated to a new site to provide a minimum separation of approximately 1,600 metres. The option to relocate the navigation aid is possible but not desirable for the following reasons.

- The relocation of an established radio beacon is generally considered to be a major undertaking requiring changes to existing air navigation charts and airport approach procedures.

- A radio beacon site must conform to stringent Civil Aviation criteria which may not be satisfied by sites available for the relocation.

Table 6.3
Ottawa Area Sub Route Evaluation

FACTOR	Data Types	Sub-route TS-A-B-G	Sub-route TS-A-F-G
	Length (km)	26.9	26.6
AGRICULTURAL RESOURCES	Area of tower base in grain & forage crops (ha)	2.4	2.0
	Land in tile drainage (km)	7.6	4.6
	Area of tower base in pasture land (ha)	0.3	0.1
	Length of agricultural land crossed (km)	17.5	13.9
APPEARANCE OF THE LANDSCAPE	Landscape types crossed (km)		
	- Natural	-	-
	- Flat untreed farmland	11.6	5.5
	- Rolling farmland (fields and woodlots)	9.7	8.0
	- Abandoned farming	4.9	11.8
	- Urban	10.7	10.7
	Number of crests affected	-	3.0
	Number of long views	3.0	4.0
	Number of road crossings	17.0	16.0
	Number of homes within the primary viewshed of the line (2km either side of the line)	466.0	472.0
BIOLOGICAL RESOURCES	Sensitive/significant biological areas (ha)	-	-
	Deer concentration areas (ha)	-	-
	Primary upland wildlife habitat (ha)	14.4	34.4
	Secondary upland wildlife habitat (ha)	11.4	5.5
	Wetlands with: - high biological value (ha)	-	-
	- medium biological value (ha)	-	-
	- low biological value (ha)	-	-
	Number of vegetated stream/river crossings	2.0	3.0
FOREST RESOURCES	Area of sugar bush or semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha)	-	-
	Area of forest management (young or semi-mature), mature/semi-mature upland hardwoods (FRI site classes 3 or 4) or semi-mature conifer or mature lowland hardwood stands (FRI site classes 1 or 2) (ha)	2.5	3.0
	Area of forest management (new growth), young /immature upland hardwoods, mature lowland hardwoods (FRI site classes 3 or 4) or semi-mature conifer stands (FRI site classes 3 or 4) (ha)	14.7	10.6
	Area of young pioneer hardwoods, conifers or lowland hardwood or mature conifer or scattered stands (ha)	19.1	34.6

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Table 6.3
Continued

		Sub-route TS-A-B-G	Sub-route TS-A-F-G
	Length (km)	26.9	26.6
FACTOR	Data Types		
HERITAGE RESOURCES	Length of line crosssing historic cultural landscapes (km)	25.3	20.0
	Number of known archaeological sites	-	-
	Area of reported but unsubstantiated and high archaeological site potential (ha)	10.7	2.0
HUMAN SETTLEMENT	Number of permanent residential buildings		
	- removals	-	-
	- in proximity	-	4
	Number of farm complexes		
	- removals	-	-
	- in proximity	-	3
	Number of farm outbuildings		
	- removals	1	-
	Number of institutional, commercial or industrial facilities		
	- removals	-	-
	- in proximity	-	-
	Number of proposed industrial developments directly affected	-	-
	Number of proposed residential developments directly affected	-	1
	Number of properties affected	104	72
MINERAL RESOURCES	Licensed pits		
	- length crossed (km)	-	-
	- number crossed	-	-
	Licensed quarries		
	- length crossed (km)	-	-
	- number crossed	-	-
	Area of high aggregate potential, Granular "A" crushed (ha)	-	-
	Area of high aggregate potential, asphalt or concrete blending sand (ha)	-	-
	Area of high aggregate potential, Granular "B" or "C" (ha)	-	-
RECREATION RESOURCES	Number of recreational sites crossed	-	4
	Length within viewsheds of private campgrounds (km)	-	-
	Length within viewsheds of public parks (km)	-	-
	Length within viewsheds of foot trails (km)	10.2	7.5
ESTIMATED COST	Present worth in 1984 dollars (millions)	15.1	14.6

Sub-route ABG was preferred because of the following advantages:

- results in less effect on rural and farm residences in proximity to the route (0 versus 7 on sub-route AFG);
- results in less effect on recreational properties (visual effect on recreational activities in the Mer Bleue and the Ramsayville Marsh versus effects on 2 golf courses, a riding stable, and Village of Kenmore recreational lands on sub-route AFG);
- avoids effect on proposed residential developments (versus crossing a 108 lot estate development on sub-route AFG);
- avoids conflict with existing air navigation and military communications facilities on sub-route AFG;
- avoids having 2 parallel transmission lines from point F to Russell DS;
- allows removal of existing 115 kV line from Russell DS to point G;
- results in better use of property fabric (follows lot line for 68 percent of route versus 27 percent on sub-route AFG);
- affects less woodlot (36.3 ha versus 48.2 ha on sub-route AFG and effects are more edge than internal);
- affects less primary wildlife habitat (14.4 ha versus 34.4 ha on sub-route AFG).

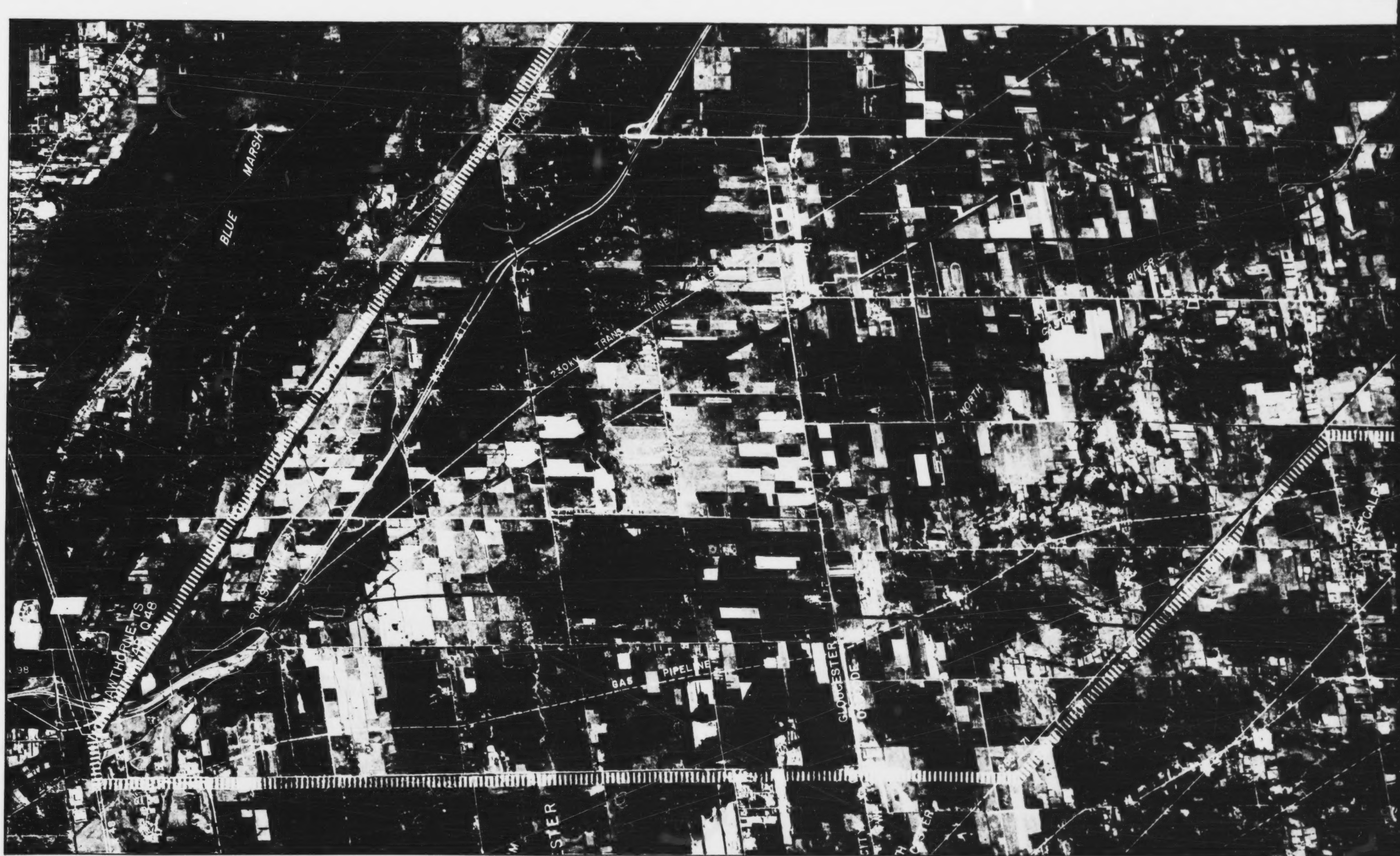
The advantages of ABG outweighed its following disadvantages:

- affects a greater amount and better quality of agricultural land (17.5 km versus 13.9 km on AFG);
- possible collisions of waterfowl with towers and conductors in the area of Ramsayville Marsh;
- affects more area with archaeological potential (10.7 ha versus 2.0 ha on sub-route AFG);
- higher cost due to remedial measures necessary to correct interference with CN and Bell Canada telecommunications facilities ($15.1 million versus $14.6 million for sub-route AFG).

6.3.2 Cornwall Area Sub-Routes

(PP_1Q_1R Versus PP_1R Versus PQQ_1R - Figure 6.3 and Table 6.4)

The first comparison was undertaken between sub-route PP_1Q_1R and PP_1R. A portion of the sub-route from point P_1 to point Q_1 parallels Highway 401 on the south side through forested land and connects with an existing 230 kV transmission line right of way wide enough to accommodate the new transmission line with minor widening.


BLUE MARSH
CN RAILWAY
230KV TRANS LINE
RIVER
CASTOR
NORTH
HAWTHORNE TS
Q48
RAMSAY
98
GAS PIPELINE
GLOUCESTER
METCALFE

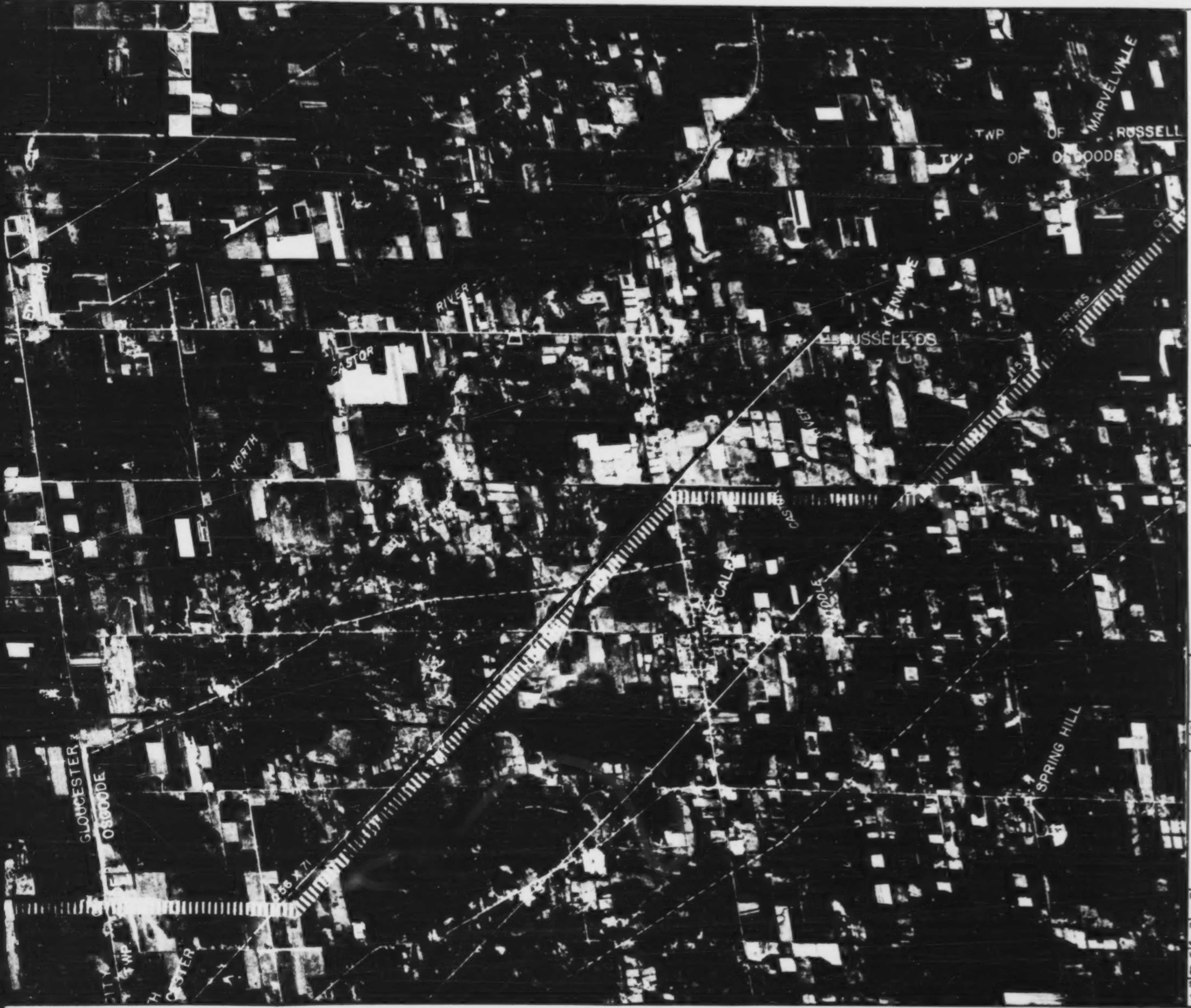

TWP OF RUSSELL
TWP OF OSGOODE
MARVELVILLE
CASTOR RIVER
RUSSELL DS
KENMORE
NORTH
CASTOR RIVER
METCALFE
OSGOODE
TRANS
SPRING HILL
GLOUCESTER
OSGOODE
56 X 71
TWP

Figure 6.2

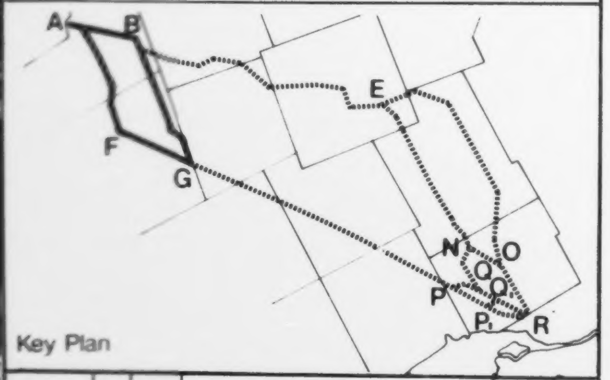
Ottawa Area Sub-routes AFG vs ABG

Legend

▮▮▮▮▮▮▮▮	Study Area Boundary
—	Alternative Routes
A	Route Intersections

Note:

Alternative routes are not drawn to scale.
All boundaries are approximate.


A
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Key Plan

MF Roll No	Rev	Date	Particulars	Drawn	App'd

Ontario Hydro
Design and Development Divsion -
Transmission

Drawn by	Supervising Planner
Date Jan. 1985	Supervising Project Engineer
Work Order 840-03016	Graphics/Prod. Supervisor

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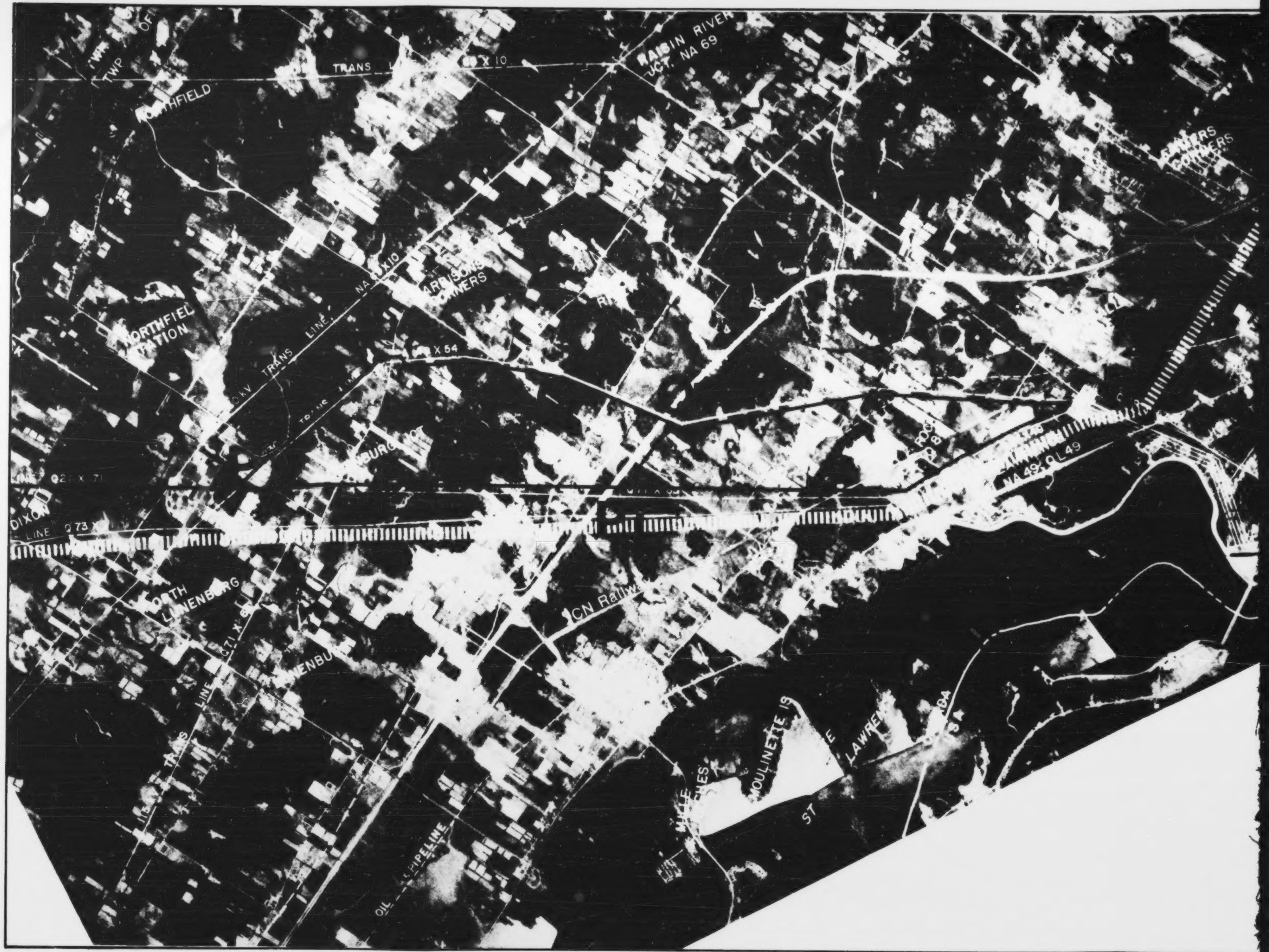
TWP OF
TWP
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X 10
NORTHFIELD
RAISIN RIVER
JCT. NA 69
NA X10
HARRISONS CORNERS
NORTHFIEL STATION
X 54
KV TRANS LINE
TRANS LINE
BURG JCT
LINE Q2 X 71
DIXON
LINE Q73 X
CN Railway
NORTH LUNENBURG
Q71 X 6
LUNENBU
TRANS LINE
OIL PIPELINE
MILLE ROCHES
MOULINETTE IS
ST LAWRENCE
NA 49 QL 49
CORNERS

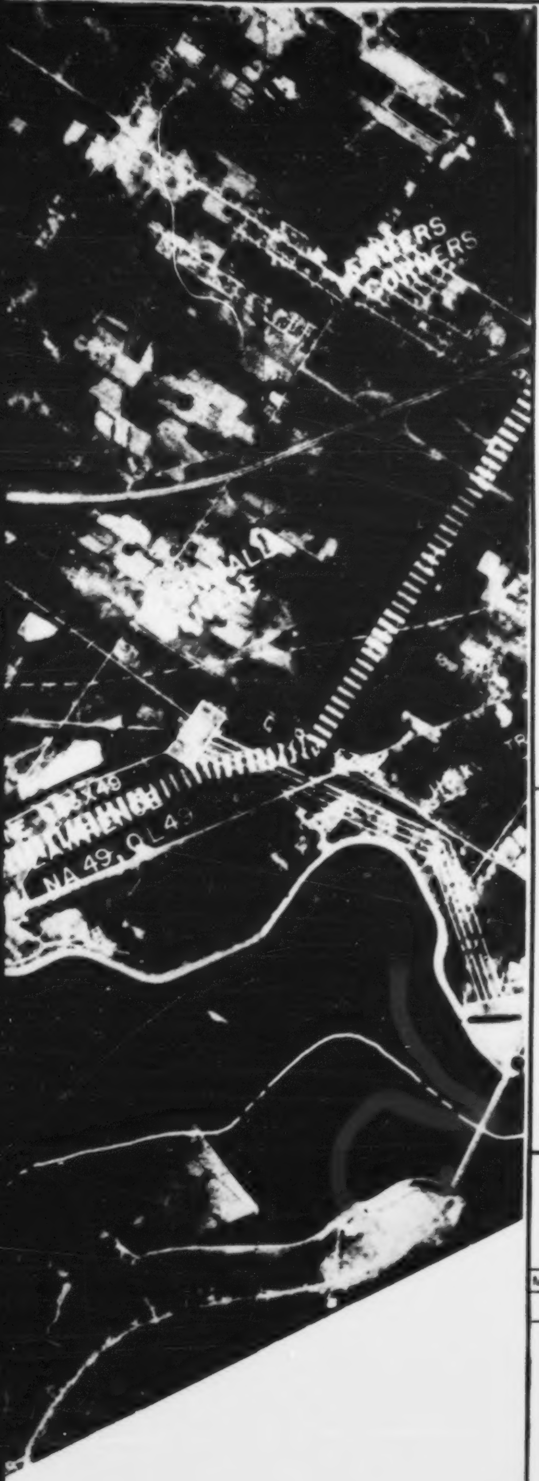


Figure 6.3

Cornwall Area Sub-routes
PP_1R vs PQQ_1R vs PP_1Q_1R

Legend

▮▮▮▮▮▮▮▮ Study Area Boundary

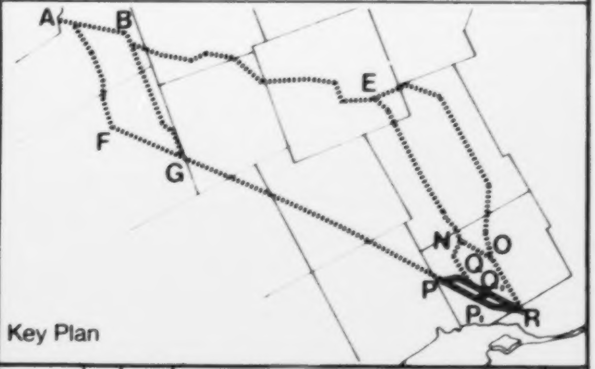
—— Alternative Routes

A Route Intersections

Note:

Alternative routes are not drawn to scale.

All boundaries are approximate.



Key Plan

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Ontario Hydro

Design and Development Divsion - Transmission

Drawn by	Supervising Planner
Date Jan. 1985	Supervising Project Engineer
Work Order 840-03016	Graphics Prod. Supervisor

Scale	Drawing No	Rev.	Sheet
1:50,000	RS-170-LUEP-RA6-0050	0	2 of 5

On sub-route PP_1R the portion from point P_1 to point R parallels the north side of an existing Ontario Hydro 115 kV transmission line crossing a number of concession roads with residential development.

Sub-route PP_1Q_1R was preferred over PP_1R because of the following advantages:

- no residences would have to be removed (0 versus 1 on sub-route PP_1R);
- results in fewer residences in proximity to the sub-route (2 versus 5 on sub-route PP_1R);
- makes use of the over-purchased Ontario Hydro right of way (12 m additional right of way for 5.6 kilometres versus 47 m additional right of way for 6.5 kilometres on sub-route PP_1R);
- there are no conflicts with the two landfill sites operated by the City of Cornwall;
- there are no conflicts with private airstrips (an airstrip is located at right angles to sub-route PP_1R);
- less cost ($5.6 million versus $6.2 million for sub-route PP_1R).

There were no disadvantages identified on sub-route PP_1Q_1R which outweighed its advantages, thus sub-route PP_1R was eliminated.

In the second comparison sub-route PP_1Q_1R versus sub-route PQQ_1R the differences in the sub-routes occurs in the north end where sub-route PP_1Q_1R crosses a forested area and sub-route PQQ_1R crosses an agricultural area with rural residential development. Sub-route PP_1Q_1R was preferred for the following advantages:

- less agricultural land crossed (2.1 km versus 3.4 km on sub-route PQQ_1R);
- less visual effect resulting from a right angle cross-over of an existing 230 kV transmission line compared to a parallel cross-over on sub-route PQQ_1R at County Road 18;
- less cost ($5.6 million versus $5.7 million on sub-route PQQ_1R).

The advantages of sub-route PP_1Q_1R outweighed its following disadvantages:

- more primary wildlife habitat affected, although the difference is primarily an edge effect (20.7 ha versus 14.1 ha on sub-route PQQ_1R);
- more high quality forest affected (2.9 ha versus 1.6 ha on sub-route PQQ_1R);
- two licensed pits are crossed versus none on PQQ_1R, however, one of the pits can be spanned.

Table 6.4
Cornwall Area
Sub-Route Evaluation

		Sub-route P-Q-Q1-R	Sub-route P-P1-R	Sub-route P-P1-Q1-R
	Length (km)	12.3	11.7	12.1
FACTOR	Data Types			
AGRICULTURAL RESOURCES	Area of tower base in grain & forage crops (ha)	0.3	0.2	0.2
	Land in tile drainage (km)	-	-	-
	Area of tower base in pasture land (ha)	0.1	0.0	0.0
	Length of agricultural land crossed (km)	3.4	2.1	2.1
APPEARANCE OF THE LANDSCAPE	Landscape types crossed (km)			
	- Natural	-	-	-
	- Flat untreed farmland	-	-	-
	- Rolling farmland (fields and woodlots)	12.3	7.9	12.1
	- Abandoned farming	-	3.8	-
	- Urban	-	-	-
	Number of crests affected	3.0	4.0	3.0
	Number of long views	2.0	2.0	2.0
	Number of road crossings	8.0	8.0	8.0
	Number of homes within the primary viewshed of the line (2km either side of the line)	188.0	171.0	208.0
BIOLOGICAL RESOURCES	Sensitive/significant biological areas (ha)	-	-	-
	Deer concentration areas (ha)	-	-	-
	Primary upland wildlife habitat (ha)	14.1	16.2	20.7
	Secondary upland wildlife habitat (ha)	1.5	6.5	2.6
	Wetlands with: - high biological value (ha)	-	-	-
	- medium biological value (ha)	-	-	-
	- low biological value (ha)	-	-	-
	Number of vegetated stream/river crossings	-	1.0	1.0
FOREST RESOURCES	Area of sugar bush or semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha)	-	-	-
	Area of forest management (young or semi-mature), mature/semi-mature upland hardwoods (FRI site classes 3 or 4) or semi-mature conifer or mature lowland hardwood stands (FRI site classes 1 or 2) (ha)	1.6	2.1	2.9
	Area of forest management (new growth), young /immature upland hardwoods, mature lowland hardwoods (FRI site classes 3 or 4) or semi-mature conifer stands (FRI site classes 3 or 4) (ha)	5.4	7.4	10.9
	Area of young pioneer hardwoods, conifers or lowland hardwood or mature conifer or scattered stands (ha)	11.6	18.2	11.0

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Table 6.4
Continued

FACTOR	Data Types	Sub-route P-Q-Q1-R	Sub-route P-P1-R	Sub-route P-P1-Q1-R
	Length (km)	12.3	11.7	12.1
HERITAGE RESOURCES	Length of line crossing historic cultural landscapes (km)	12.3	11.7	10.8
	Number of known archaeological sites	-	-	-
	Area of reported but unsubstantiated and high archaeological site potential (ha)	4.1	2.4	4.4
HUMAN SETTLEMENT	Number of permanent residential buildings			
	- removals	-	1	-
	- in proximity	1	3	1
	Number of farm complexes			
	- removals	-	-	-
	- in proximity	1	2	1
	Number of farm outbuildings			
	- removals	-	-	-
	Number of institutional, commercial or industrial facilities			
	- removals	-	-	-
	- in proximity	-	-	-
	Number of proposed industrial developments directly affected	-	-	-
	Number of proposed residential developments directly affected	-	-	-
	Number of properties affected	40	33	39
MINERAL RESOURCES	Licensed pits			
	- length crossed (km)	-	1.0	1.0
	- number crossed	-	2.0	2.0
	Licensed quarries			
	- length crossed (km)	0.1	0.4	0.1
	- number crossed	1.0	1.0	1.0
	Area of high aggregate potential, Granular "A" crushed (ha)	-	-	-
	Area of high aggregate potential, asphalt or concrete blending sand (ha)	-	-	-
	Area of high aggregate potential, Granular "B" or "C" (ha)	-	-	-
RECREATION RESOURCES	Number of recreational sites crossed	-	-	-
	Length within viewsheds of private campgrounds (km)	-	-	-
	Length within viewsheds of public parks (km)	4.3	1.4	4.3
	Length within viewsheds of foot trails (km)	-	-	-
ESTIMATED COST	Present worth in 1984 dollars (millions)	5.7	6.2	5.6

6.3.3 Casselman to Cornwall Sub-Routes
(ENOR Versus ENQQ$_1$R Versus EOR - Figure 6.4 and Table 6.5)

The first comparison was undertaken between sub-routes ENQQ$_1$R and ENOR. The NOR portion parallels existing Ontario Hydro transmission lines through predominantly forest land between points N and O and a mixture of agricultural and rural residential land between points O and R. Sub-route ENQQ$_1$R is similar in nature, however, it has the advantage of requiring only an additional 12 m of right of way to accommodate the 500 kV transmission line in the QQ$_1$R portion. The portion of the sub-route between points N and O is within 200 to 250 metres of an Ontario Provincial Police and Ministry of Transportation and Communications mobile radio stations east of Northfield. Both these facilities would require relocation to a minimum separation of 500 metres if sub-route ENOR were selected.

Sub-route ENQQ$_1$R was preferred because of the following advantages:

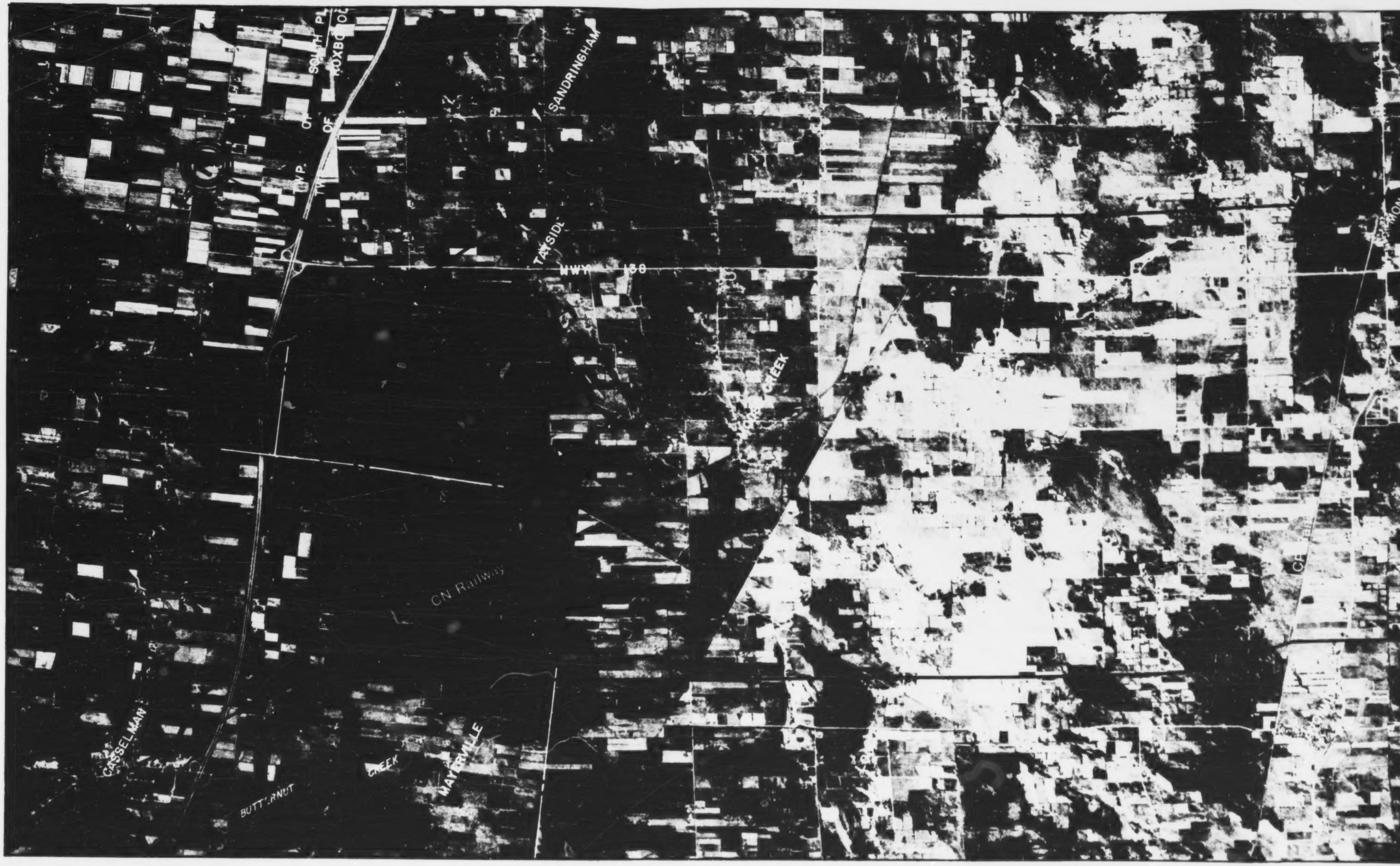
- less effect on existing residences (9 versus 14 in proximity and one removal on sub-route ENOR);
- less effect on mineral resources (spans the corner of a licensed quarry versus 2 to 3 towers in the middle of a pit on sub-route ENOR);
- fewer visual effects on sub-route NQQ$_1$R and there would be 2 transmission lines versus 3 on sub-route ENOR;
- use of a right of way owned by Ontario Hydro which requires a minor widening along the portion QQ$_1$R;
- less visual effect on historic cultural landscapes and historic buildings;
- slightly less high quality forest affected (0.9 ha versus 2.1 ha on sub-route ENOR);
- no technical problems versus the need to relocate MTC and OPP mobile radio transmitters on sub-route ENOR.

The advantages of sub-route ENQQ$_1$R outweighed its following disadvantages:

- more primary wildlife habitat affected (35.3 ha versus 30.9 on sub-route ENOR);
- higher cost ($16.0 million versus $15.0 million for sub-route ENOR);
- more total forest area affected (82.1 ha versus 76.5 ha on sub-route ENOR).

The second comparison was undertaken between sub-routes ENQQ$_1$R and EOR. Sub-route ENQQ$_1$R follows the property fabric over the ENQ portion and traverses high quality farm land particularly north of point N. The portion south of point N affects both forest land, wetland and agricultural land of varying quality and uses the Ontario Hydro owned right of way over the QQ$_1$R portion.

Sub-route EOR follows the northern edge of the Moose Creek Bog and then turns south following the property fabric to near Monkland where the sub-route diagonally crosses a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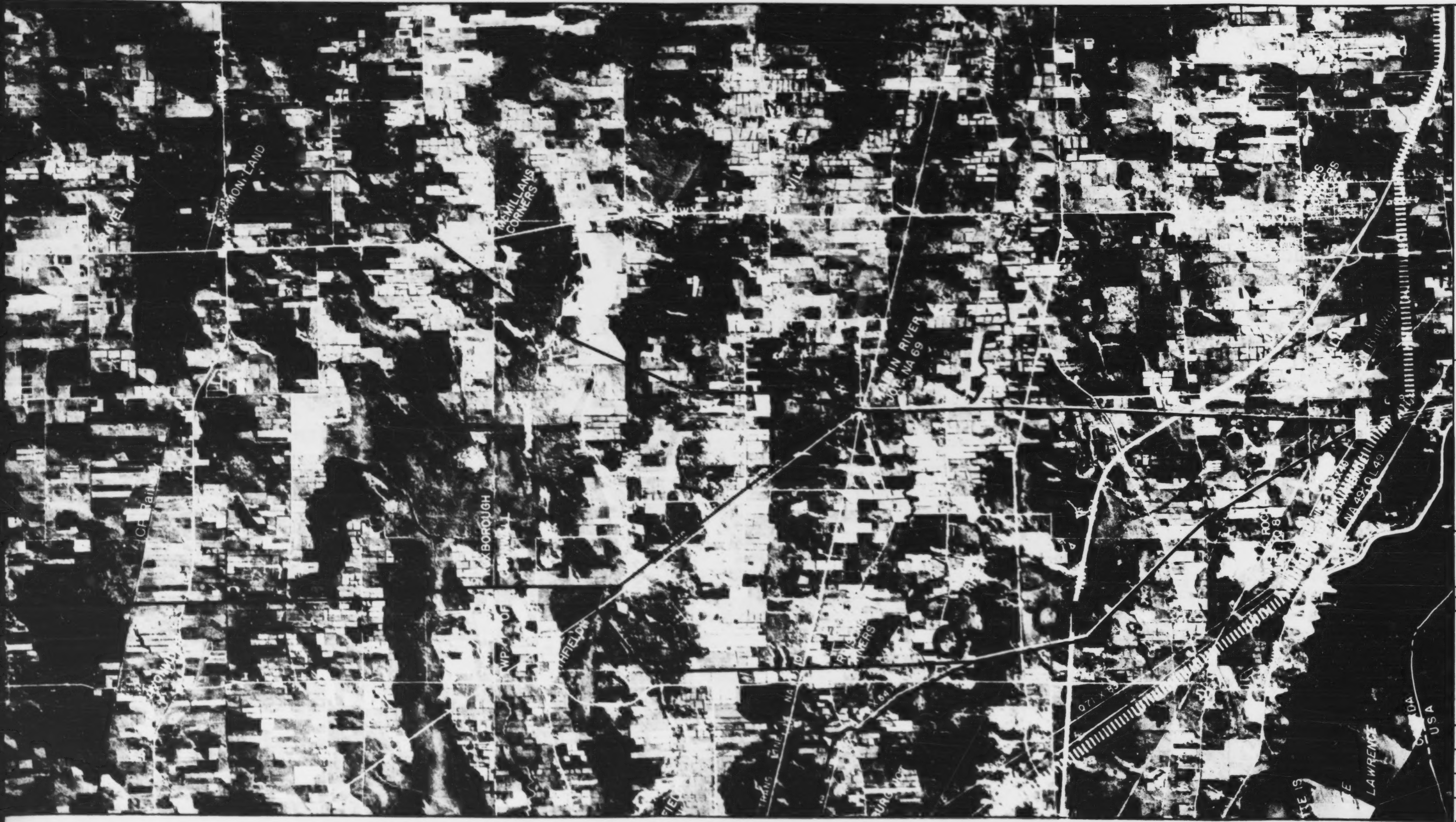
BUTTERNUT
CREEK
MAYERVILLE
LAND


GRAVEL N.L.
MON. LAND
McMILLANS CORNERS
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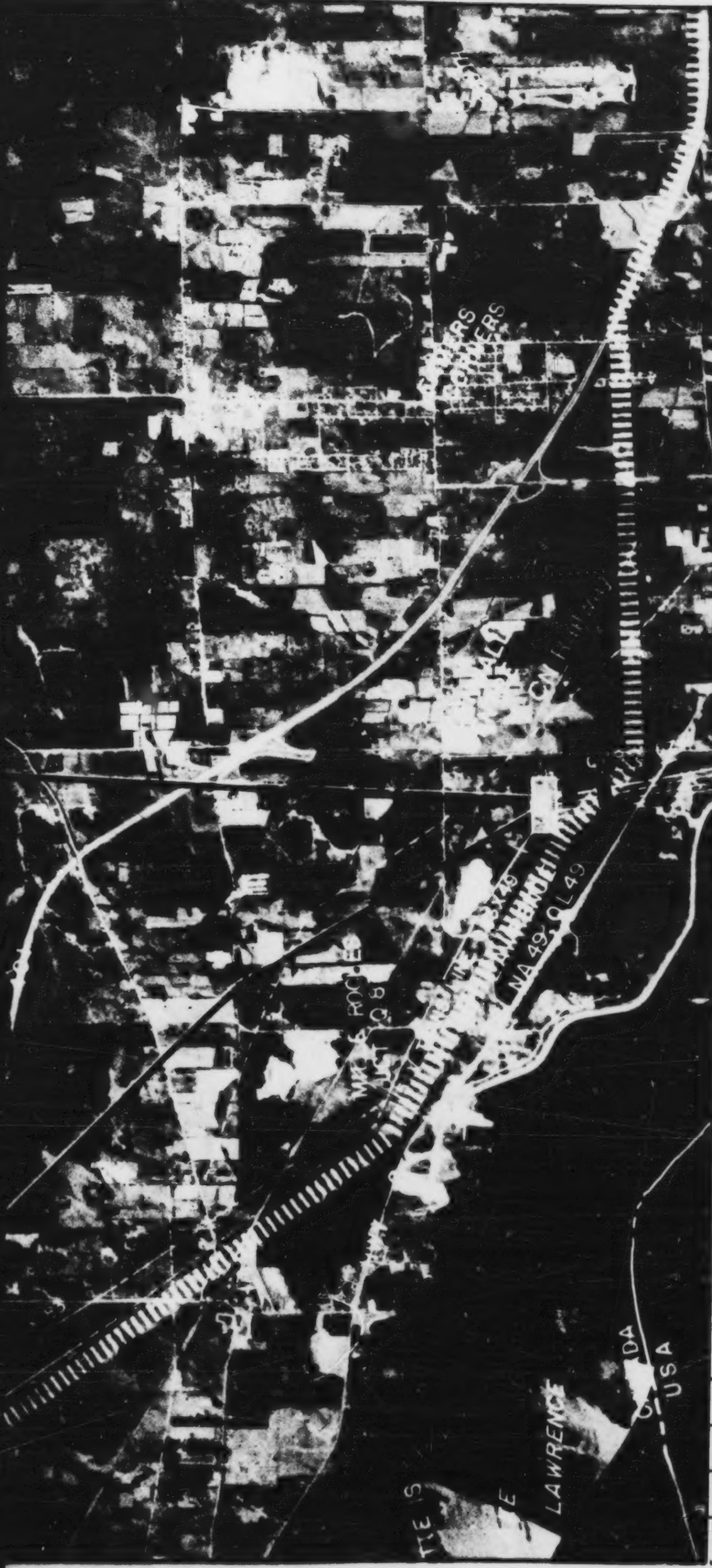


Figure 6.4

Casselman to Cornwall Sub-routes

ENOR vs $ENQQ_1$ R vs EOR

Legend

||||||||| Study Area Boundary

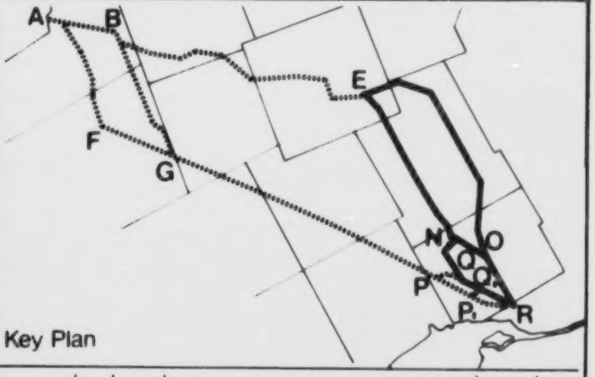
—— Alternative Routes

A Route Intersections

Note:

Alternative routes are not drawn to scale.

All boundaries are approximate.



Key Plan

MF Roll No	Rev	Date	Particulars	Drawn	App'd

Ontario Hydro

Design and Development Divsion - Transmission

Drawn by K. Kolyn	Supervising Planner
Date Jan. 1985	Supervising Project Engineer
Work Order 840-03016	Graphics Prod Supervisor

Scale	Drawing No	Rev	Sheet
1:50,000	RS-170-LUEP-RA6-0050	0	3 of 5

Table 6.5

Casselman to Cornwall
Sub-Route Evaluation

		Sub-route E-O-R	Sub-route E-N-O-R	Sub-route E-N-Q-Q1-R
	Length (km)	41.5	36	36.8
FACTOR	Data Types			
AGRICULTURAL RESOURCES	Area of tower base in grain & forage crops (ha)	2.2	2.3	2.3
	Land in tile drainage (km)	3.9	3.0	2.5
	Area of tower base in pasture land (ha)	0.2	0.2	0.3
	Length of agricultural land crossed (km)	17.9	16.9	17.9
APPEARANCE OF THE LANDSCAPE	Landscape types crossed (km)			
	- Natural	-	1.1	1.1
	- Flat untreed farmland	4.1	5.2	5.2
	- Rolling farmland (fields and woodlots)	35.2	27.7	28.5
	- Abandoned farming	2.2	2.0	2.0
	- Urban	-	-	-
	Number of crests affected	7.0	15.0	11.0
	Number of long views	5.0	7.0	7.0
	Number of road crossings	19.0	19.0	17.0
	Number of homes within the primary viewshed of the line (2km either side of the line)	475.0	450.0	445.0
BIOLOGICAL RESOURCES	Sensitive/significant biological areas (ha)	-	-	-
	Deer concentration areas (ha)	1.2	9.0	6.6
	Primary upland wildlife habitat (ha)	66.0	30.9	35.3
	Secondary upland wildlife habitat (ha)	10.8	4.7	3.5
	Wetlands with: - high biological value (ha)	1.3	12.3	14.1
	- medium biological value (ha)	6.7	5.6	2.6
	- low biological value (ha)	-	5.9	5.9
	Number of vegetated stream/river crossings	1.0	1.0	-
FOREST RESOURCES	Area of sugar bush or semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha)	4.0	-	-
	Area of forest management (young or semi-mature), mature/semi-mature upland hardwoods (FRI site classes 3 or 4) or semi-mature conifer or mature lowland hardwood stands (FRI site classes 1 or 2) (ha)	2.3	2.1	0.9
	Area of forest management (new growth), young /immature upland hardwoods, mature lowland hardwoods (FRI site classes 3 or 4) or semi-mature conifer stands (FRI site classes 3 or 4) (ha)	18.2	26.1	26.5
	Area of young pioneer hardwoods, conifers or lowland hardwood or mature conifer or scattered stands (ha)	68.6	48.3	54.7

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Table 6.5
Continued

FACTOR	Data Types	Sub-route E-O-R	Sub-route E-N-O-R	Sub-route E-N-Q-Q1-R
	Length (km)	41.5	36	36.8
HERITAGE RESOURCES	Length of line crossing historic cultural landscapes (km)	34.6	28.7	29.7
	Number of known archaeological sites	-	-	-
	Area of reported but unsubstantiated and high archaeological site potential (ha)	10.6	13.3	15.2
HUMAN SETTLEMENT	Number of permanent residential buildings			
	- removals	1	1	-
	- in proximity	4	3	1
	Number of farm complexes			
	- removals	-	-	-
	- in proximity	10	11	8
	Number of farm outbuildings			
	- removals	-	-	-
	Number of institutional, commercial or industrial facilities			
	- removals	-	-	-
	- in proximity	1	1	-
	Number of proposed industrial developments directly affected	-	-	-
	Number of proposed residential developments directly affected	-	-	-
	Number of properties affected	74	60	72
MINERAL RESOURCES	Licensed pits			
	- length crossed (km)	0.7	0.7	-
	- number crossed	2.0	2.0	-
	Licensed quarries			
	- length crossed (km)	-	-	0.1
	- number crossed	-	-	1.0
	Area of high aggregate potential, Granular "A" crushed (ha)	1.5	2.3	0.9
	Area of high aggregate potential, asphalt or concrete blending sand (ha)		-	-
	Area of high aggregate potential, Granular "B" or "C" (ha)	0.6	-	6.8
RECREATION RESOURCES	Number of recreational sites crossed	-	-	-
	Length within viewsheds of private campgrounds (km)	-	-	-
	Length within viewsheds of public parks (km)	4.5	4.5	5.9
	Length within viewsheds of foot trails (km)	-	-	-
ESTIMATED COST	Present worth in 1984 dollars (millions)	17.3	15.0	16.0

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mixture of farm land and forest to point O. Transport Canada is in the process of selecting an air navigation aid site in the vicinity of Monkland. The minimum separation required by Transport Canada would be 4.8 km. There would be a conflict with the proposed navigation aid in the vicinity of Monkland on sub-route EOR. From points O to R the sub- route parallels the west side of two existing transmission lines.

Sub-route $ENQQ_1R$ was preferred because of the following advantages:

- less cost ($16.0 million versus $17.3 million for sub-route EOR);
- less primary and less secondary upland wildlife habitat affected (35.3 ha versus 66.0 ha and 3.5 ha versus 10.8 ha on sub-route EOR respectively);
- less total forest area affected (82.1 ha versus 93.1 ha on sub-route EOR) and less high quality woodlot affected (0.9 ha versus 2.3 ha on sub-route EOR);
- avoids the historic features of the Warina area and avoids increasing the visual effects on historic buildings between points O and R;
- less effect on mineral resources (one high and two medium quality deposits crossed versus two pits, one high quality and one medium quality deposits crossed on sub-route EOR);
- avoids potential market gardening area of Moose Creek Bog;
- use of a right of way owned by Ontario Hydro which requires a minor widening along the portion QQ_1R.

There were no disadvantages identified on sub-route $ENQQ_1R$ which outweighed its advantages, thus sub-route EOR was eliminated.

6.4 Alternative Route Evaluation

Once a preferred sub-route was selected in each of the three areas:

- Ottawa area (ABG);
- Cornwall area (PP_1Q_1R); and
- Casselman to Cornwall ($ENQQ_1R$),

two final alternative routes between Ottawa and Cornwall were identified. These routes were referred to as the Highway 417 route ($ABENQQ_1R$) and the 115 kV transmission line route ($ABGPP_1Q_1R$). The following two sub-sections (6.4.1 and 6.4.2) provide an evaluation of these two final alternative routes.

6.4.1 Highway 417 Route ($ABENQQ_1R$) (Figure 6.5, Figure 6.6, Figure 6.7, and Table 6.6)

6.4.1.1 Land Use and Environment

Extensive areas of agricultural land are crossed by this alternative route in the Townships of Gloucester, Cambridge, and Roxborough with a small pocket occurring in Cumberland Township south of Vars. Farming also occurs along the alternative route in Russell and Cornwall townships, however, the agricultural land affected is not generally as extensive. This alternative route crosses 35.6 km of active agricultural land, the majority of which is soil capability class 1-3 and intensively cultivated in grains and forages. The maximum area of land which could be removed from production by tower bases is 4.6 ha in grains and forages and 0.7 ha in pasture. In these locations, the alternative route parallels existing severances and was located along property boundaries. In some locations, where rural residences are near the property boundaries, the route deviates from the property line. In locations of intensive cultivation where property line or field boundary tower locations are not possible, narrow base towers may be used to reduce the loss of agricultural land.

The landscape north of Highway 417 is flat to gently rolling and heavily treed, particularly between point B and Concession V in Cambridge Township. Although the alternative route is highly visible from Highway 417 for part of its length, the trees reduce the overall visibility from the north and south. From point A to B, the route follows the bottom of a small valley in which the towers would dominate the views from the residences situated on the surrounding ridges.

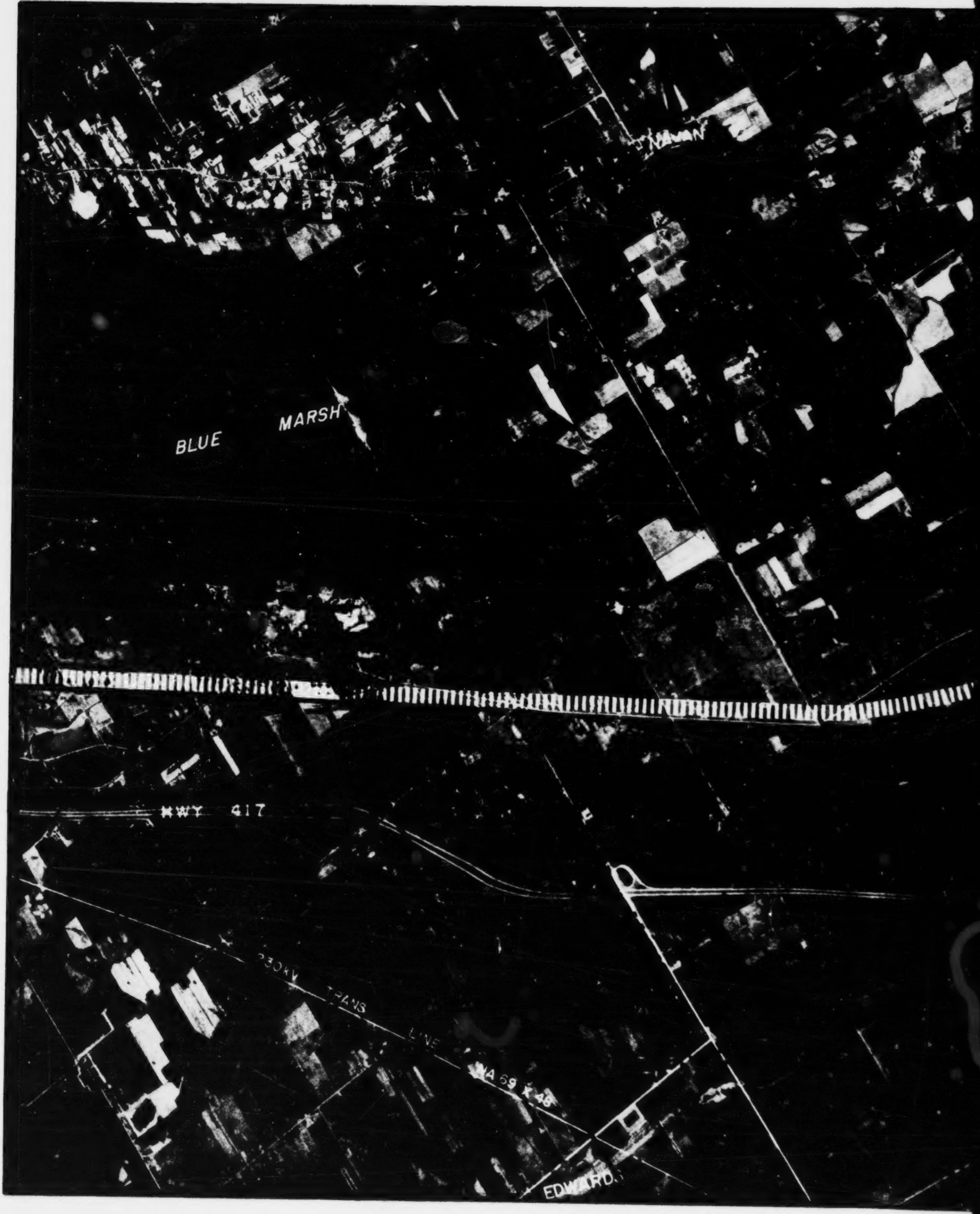
South of point E, the landscape is generally flat and untreed to Concession VII in Roxborough Township. This route would be highly visible. The remainder of this route would cross landscapes that have 30-40% tree cover and numerous crests which run east to west. The towers would be skylined on these crests and would conflict with the existing landscape character.

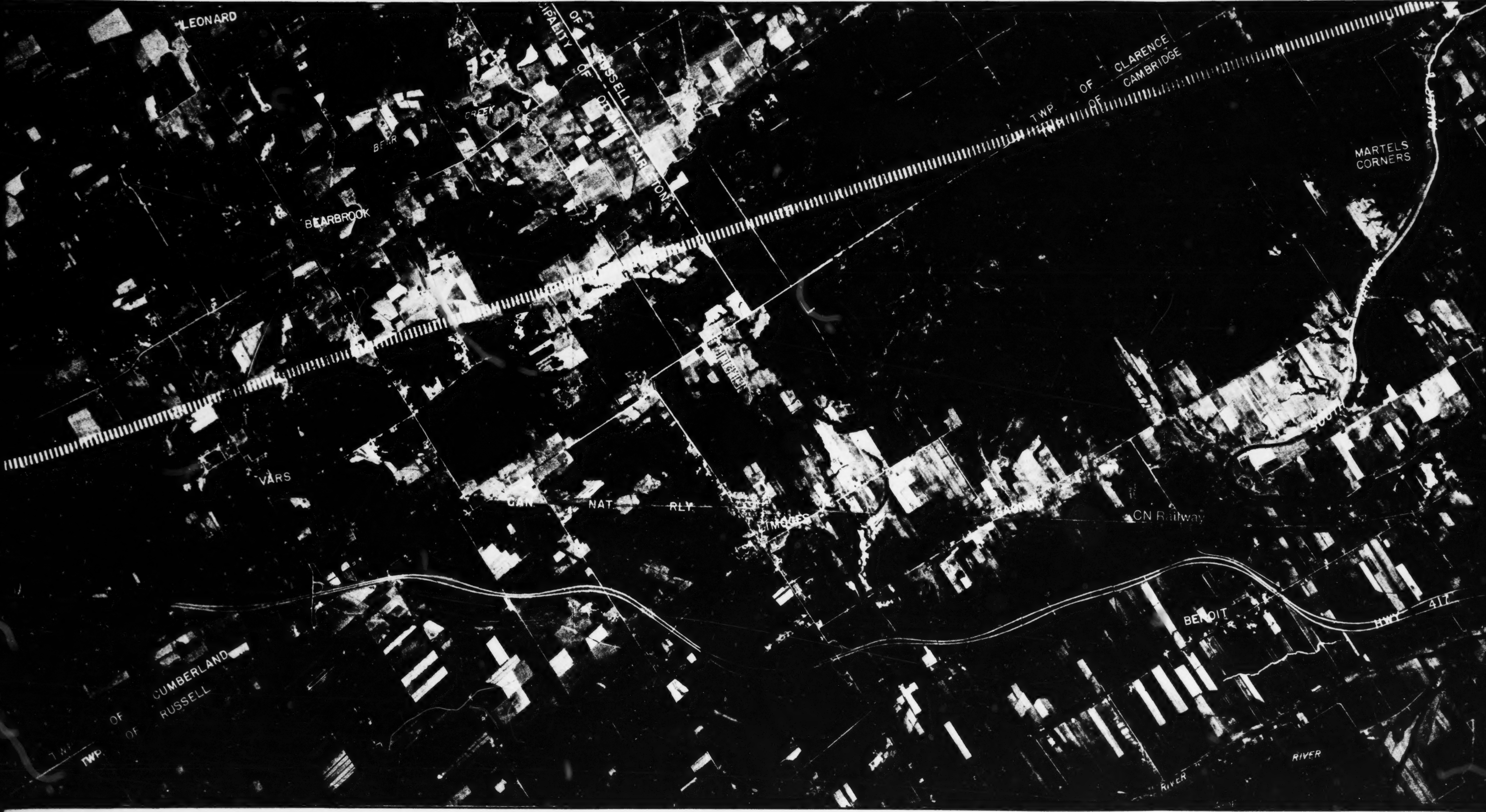
The majority of effects on the biological resources occur along the Highway 417 portion of this route. From point A to point B where the route parallels the CN railway adjacent to the Ramsayville Marsh, there may be a minor effect on waterfowl. Between point B and Concession V in Cambridge Township, 103 ha of primary upland wildlife habitat would be affected. The route would affect 139.1 ha of primary upland wildlife habitat.

In Roxborough Township, this route crosses the Newington Bog an area of high habitat value based on its diversity and productivity. Approximately 14 ha of swamp would be affected in this wetland complex. Further south, the edge of the Mud Lake Swamp is followed with no significant effect on the wetland or deer wintering area. The Moose Creek Bog is also marginally affected along its edge through an area of immature poplar. No designated sensitive or significant biological areas are affected by this alternative route.

The forest resources affected on the Highway 417 route from point B to point Q would be removed within the width of the right of way, the result being the permanent loss of the resource. The QQ_1R portion of the route shares an existing right of way, thereby reducing the total resource affected. In total, the route affects 183.2 ha of forest resource. The Hawthorne TS to point B portion affects 11.4 ha of which some is good quality semi-mature conifer and some is immature hardwood near Carlsbad Springs and Highway 417. Point B to point E affects approximately 89.7 ha of forested land, including 2.9 ha of sugar maple bush and 26.2 ha of managed forest. The rest of the route from point B to point E affects pioneer and low land hardwoods. Over the remainder of the route a total of 82.1 ha of forested land is affected. Managed forest comprises 8.6 ha of this alternative with the remaining area affected being primarily quality hardwood, semi-mature in age.

This alternative route crosses 49.8 km of historic cultural landscape and 48 ha of high archaeological potential. A transmission line would alter the character of the cultural landscapes between points A and Q where a new right of way is created. From A to B the route crosses an early agricultural landscape, within a small valley which has experienced


NAVAN
BLUE MARSH
HWY 417
230KV TRANS LINE
A 69 K 48
EDWARD.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CIPALITY OF RUSSELL
OF OTTAWA CARLETON
BEAR CREEK
BEARBROOK
TWP. OF CLARENCE
TWP. OF CAMBRIDGE
MARTELS CORNERS
RIVER
SOUTH
VARS
CAN. NAT. RLY.
LIMOGES
GAGNON
CN Railway
BENOIT
HWY 417
TWP. OF CUMBERLAND
TWP. OF RUSSELL
RIVER
RIVER

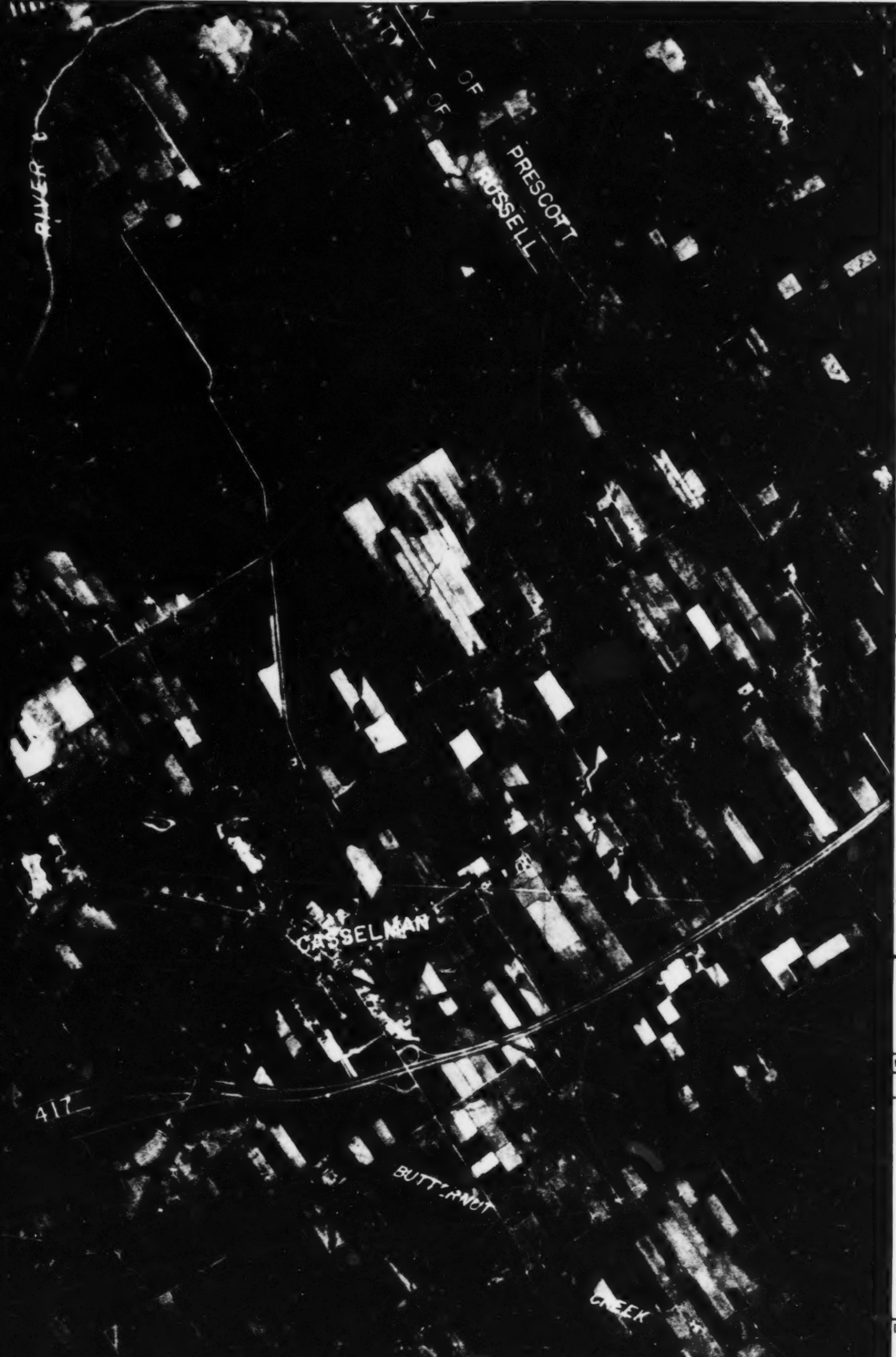

RIVER
OF
OF
PRESCOTT
RUSSELL
CASSELMAN
417
BUTTERNUT
CREEK
MAYERVILLE

Figure 6.5

Highway 417 Route
Point B to Point E

Legend

!!!!!!!! Study Area Boundary

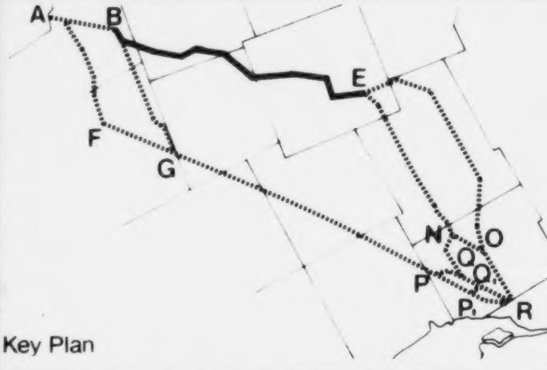
—— Alternative Routes

A Route Intersections

Note:

Alternative routes are not drawn to scale.

All boundaries are approximate.


A
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Key Plan

MF Roll No	Rev	Date	Particulars	Drawn

Ontario Hydro

Design and Development Divsion
Transmission

Drawn by K. Kolyn

Date
Jan. 1985

Work Order
840-03016

Scale
1:50,000

Supervising Planner

Supervising Project Engineer

Graphics Prod Supervisor

Drawing No
RS-170-LUEP-RA6-0050

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limited modernization. Between points B to E the route crosses a small area south of the Village of Vars in which the early farmsteads with some log buildings still stand. The alternative is highly visible crossing the landscape between Vars and Highway 417. The Highway 417 route from point E to point R crosses a landscape comprised of farmsteads interspersed among woodlots. Crossing through the rolling topography of this area, the line is visible for long distances and contrasts with the rural landscape. The route parallels an existing 230 kV transmission line from point Q to point R, crossing historic county road 36 (Dundas Street). No historic buildings would be removed.

No residences, farm complexes, industrial, commercial or institutional buildings are on the right of way. The alternative route would be in proximity to 4 residences and 8 farm complexes, affecting approximately 185 properties. From point A to point E the route follows the existing linear severances by paralleling the CN railway and Highway 417 for about 67 percent of its length. However, diagonal easements would be required for the majority of the route because the CN railway and Highway 417 do not follow property fabric. The route from point E to point Q follows property fabric through active agricultural land. From point Q to point R the route parallels an existing 230 kV transmission line with Ontario Hydro owning all but 12 m of the required additional right of way.

The route avoids existing and proposed development near the Highway 417 interchanges. No conflicts are expected with future development as identified in draft plans of subdivision, Official Plans and Zoning By-laws.

No mineral resources are affected between points A to E of the route. From point E to N the route crosses a high aggregate potential deposit with no expected effect because no towers need be located on the resource. Between points N to Q the route affects approximately 1 km of high aggregate potential, possibly requiring the placement of two or three towers in the deposit. From point Q_1 to point R one licensed quarry for a distance of approximately 0.1 km is crossed, however, no towers need to be located in the resource.

The route would be within the viewsheds of a private campground at Limoges, and recreational features within the Mer Bleue Conservation Area. The towers would be on the opposite side of the CN railway to the proposed Ramsayville Marsh foot trails and interpretation centre, which would be an extension to the existing Mer Bleue development north of the railway.

6.4.1.2 Socio-Economic and Public Involvement

The following evaluation provides a perspective on the socio-economic environment through which the Highway 417 alternative route passes. It is a broad perspective, relying on township-based rather than route specific information. Additional information is provided in Appendix B6.6.

In terms of ability to handle change, the population of the municipalities along the Highway 417 route had populations which were generally younger than the 1981 provincial average and experienced a much more rapid population growth than the provincial average in the 1976 to 1981 period. Only Roxborough Township experienced a marginal population expansion in the period. Half of the townships affected by this route appeared to encourage residential development and half favoured the preservation of agricultural land.

With respect to the compatibility of a transmission line with the community, municipalities along the Highway 417 route have a somewhat larger urban population, some rural estate development, and a smaller farm population than along the 115 kV alternative route. The commercial/industrial/business assessment in the townships affected by this route, as a percentage of total assessment in the townships, ranged from 6 percent to 46 percent.

Relative to economic base change, municipalities along the Highway 417 route would experience slightly more change than municipalities along the existing 115 kV transmission line route. The change is attributable to greater agricultural and forest products losses due to the construction and operation of a 500 kV transmission line.

The Highway 417 route roughly parallels Highway 417 and County Road 15, thereby creating no new access into the affected townships. There was a perceived incompatibility of a 500 kV transmission line with the agricultural character of the communities in Russell, Cambridge and Roxborough townships. Public comments on the Highway 417 route focused attention on the potential effects of the line on:

- prime agricultural land, and land improved through tile drainage in Cumberland, Russell, Cambridge and Roxborough Townships;
- inconvenience to farm equipment operation particularly in Russell and Cambridge Townships;
- future development plans near Vars, Limoges, Casselman and the Township of Cornwall;
- woodlots and sugar bushes in Cumberland, Cambridge, Roxborough and Cornwall Townships; and
- the determination of property values and compensation.

In addition, many property owners stated their preference for use of an existing Ontario Hydro right of way rather than a new route, especially when that existing right of way appeared to be the cheapest and most direct.

6.4.1.3 Cost/Technical

The estimated cost to build a single circuit 500 kV transmission line along the Highway 417 route is $42.1 million. This cost estimate includes the extra costs involved in remedial work required to correct interference on telecommunications facilities operated by CN and Bell Canada where there are close parallels with these facilities between Hawthorne TS and point B. Also included in the cost estimate are higher tower foundation costs along 40.3 km of the route where deep leda clay deposits are crossed (refer to Table 6.1).

The Highway 417 route crosses 35.6 km of active agricultural land. The use of narrow base lattice towers along this route has the potential to increase the estimated cost by approximately 9 percent. Soil conditions may prohibit the use of narrow base tower footings in areas of deep leda clay.

6.4.2 115 kV Transmission Line Route (ABGPP Q R) (Figure 6.6, Figure 6.7 and Table 6.6)

6.4.2.1 Land Use and Environmental

Extensive areas of agricultural land are crossed by the alternative route in the Townships of Osgoode, Russell, Winchester, Finch and Osnabruck. The alternative route crosses 49.1 km of agricultural land, the majority of which is soil capability class 1-3 and intensively cultivated in grains and forage. The area of land affected by tower bases is approximately 2.5 ha in grains and forages and 0.3 ha in pasture. The alternative route crosses 14.4 km of land in tile drainage.

A large area affected is along the existing 115 kV transmission line, which is a diagonal easement for its entire length. The potential for tower placement on fencerows is limited. The use of narrow base towers and the replacement of the existing 115 kV transmission line with the new 500 kV transmission line from point G to point P will result in little change to the existing farm operations. Another high quality agricultural area affected is from the north end of Osgoode township to point G. The alternative route follows a mid concession line in Concession X for most of its length, resulting in adjacent farmers sharing the right of way.

From point A to point B the route follows the bottom of a small valley, in which the towers would dominate the views from the houses situated on the surrounding ridges. Over the portion of the route from point B to point P the towers would be highly visible on the flat agricultural landscape. The landscape is generally untreed between points G and P. The section between points P to R is gently rolling with 50-60 percent tree cover. Where the route parallels an existing 115 kV transmission line, it would interfere with the long views to the south. The towers on the parallel portion of the route to Highway 401 would be highly visible because of its proximity to the highway.

Biological resources are not greatly affected because of the use of existing rights of way and other developments along the route which have already altered the habitat quality. The portion of the route parallel to the CN railway from Hawthorne TS to point B marginally affects two small woodlots of secondary upland wildlife habitat. This portion of the route is on the opposite side of the CN railway from the Ramsayville Marsh waterfowl area. Immediately north of point B the route affects one large woodlot of secondary upland wildlife habitat. South of point B it affects the edge of a woodlot with primary upland wildlife habitat. The secondary habitat is already greatly affected by Highway 417, residential development and County Road 29 and thus no significant effects on wildlife are expected. The remainder of the route from point G to point R affects woodlots which are secondary upland wildlife habitat. There would be minor impacts to these areas because only a widening of the existing transmission line right of way would be required. No designated sensitive or significant biological areas, deer concentration areas or wetlands are affected.

The forest resources would be removed within the right of way, the result being the permanent loss of the resource. Where the route parallels existing rights of way, the sharing of that right of way will reduce the amount of the resource lost. A total of 82.4 ha of forested land would be affected. The 115 kV transmission line route affects 36.3 ha of forest between Hawthorne TS and point G, 7.3 ha of which is under the Woodlot Improvement Act (WIA) and the remainder semi-mature conifer and immature hardwood. Along the existing 115 kV transmission line easement from point G to point P, 21.3 ha of total area is affected within which 7.0 ha is managed forest and 0.6 ha is sugar maple bush. The route from point P to point R affects 24.8 ha of forest land in total. The majority of this area is productive hardwood forest south of Highway 401 between points P_1 and Q_1 and adjacent to the Raisin River from point Q_1 to point R. One managed forest, a Tree Farm Agreement (0.2 ha) is affected between points Q_1 and R.

The route crosses 22.9 ha of land with high archaeological potential and 65.1 km of historic cultural landscape. A transmission line located between points A and G will result in an alteration to the historic cultural landscape which is primarily agricultural in character. The remainder of the route has already had the historic character altered by existing transmission lines to which the addition of another will not significantly change the viewers' perceptions. Between points A and B the route crosses an early agricultural landscape with limited modernization of farm buildings. In contrast from point B to point G where the route is located along the mid-concession to the rear of farmsteads, most farm buildings have been modernized.

From point G to point P the route passes close to the communities of Dixon and North Winchester both of which have historic farmsteads located adjacent to the route PP_1Q_1R. Historic settlement roads of County Road 18 and Dundas Street (County Road 36) are crossed between points P and R.

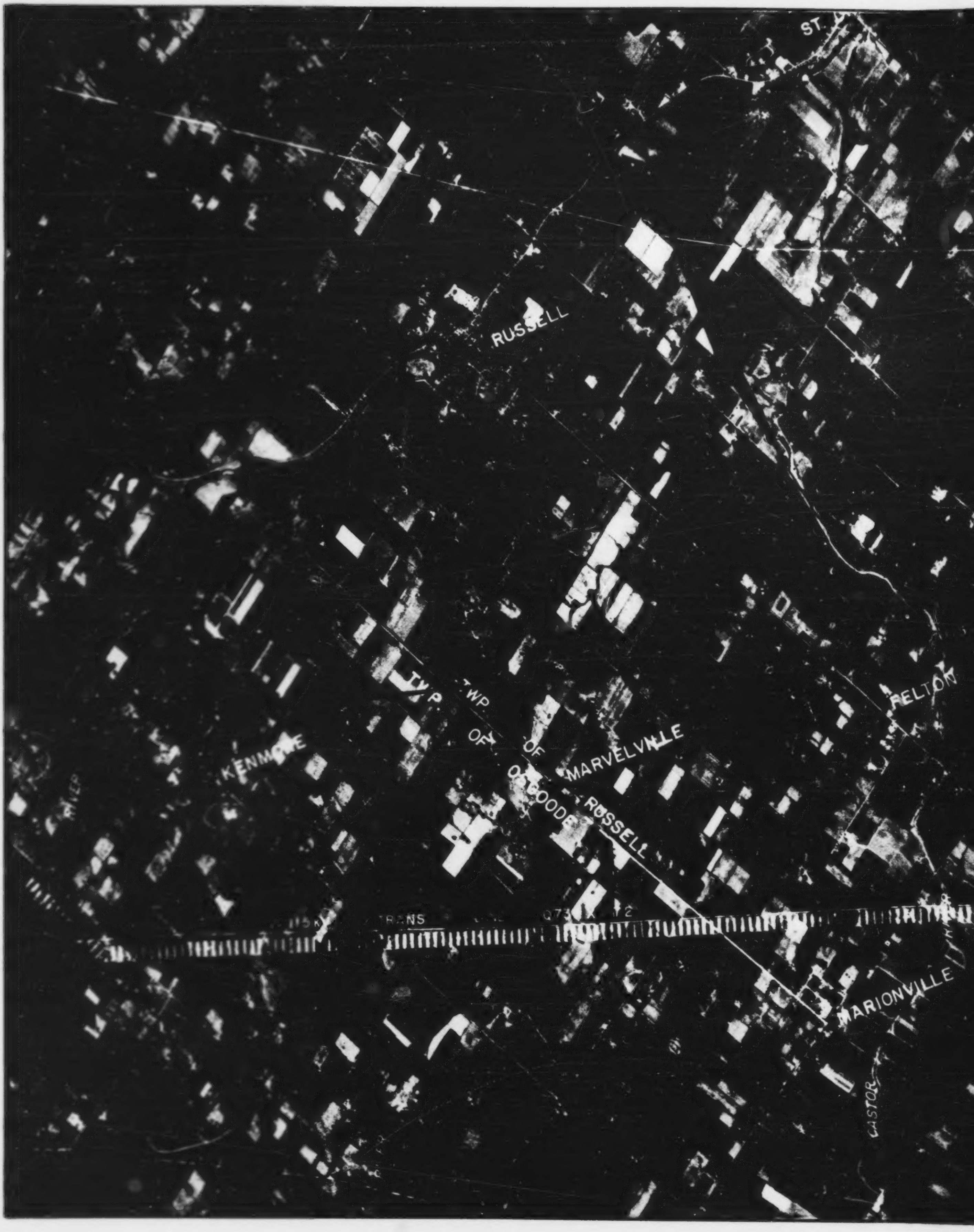
No residences, farm complexes, industrial, commercial, or institutional buildings are on the right of way. Twenty-two farm complexes and six rural residences are, however, in proximity, to the route. In total 242 properties are affected. The route makes good use of property fabric, existing linear severances and existing transmission line rights of way. The 500 kV transmission line would replace the 115 kV transmission line from point G to point P and use part of a right of way owned by Ontario Hydro between points Q_1 and R. No conflicts are expected with future development as identified in draft plans of subdivision, Official Plans and Zoning By-laws.

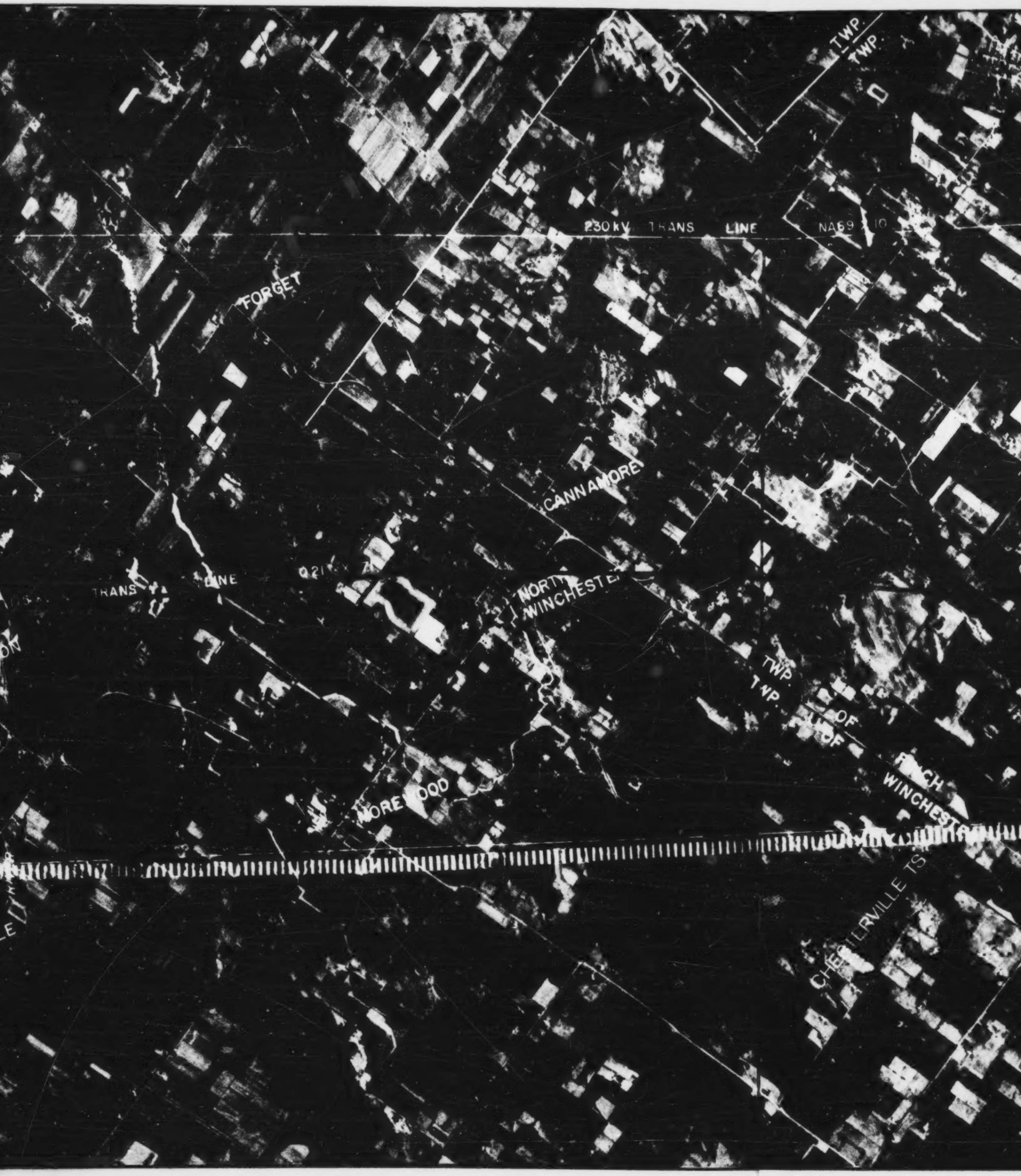
No mineral resources are affected between points A and G. From point G to point P the route crosses two licensed pits and two licensed quarries. One pit is crossed diagonally and may require up to three towers, however the expected effect is low. One quarry is also crossed diagonally and would require at least one tower. The remaining pits and quarries are crossed at their corners with no towers expected to be required on them. Between points P and R the route crosses two pits requiring at least one tower in one and two or three towers in the other with moderate effects on both. One quarry is diagonally crossed, but the effect is expected to be low because the right of way will parallel the existing transmission line. The route also crosses three high aggregate potential deposits: two may be spanned and the remaining one would possibly require one tower.

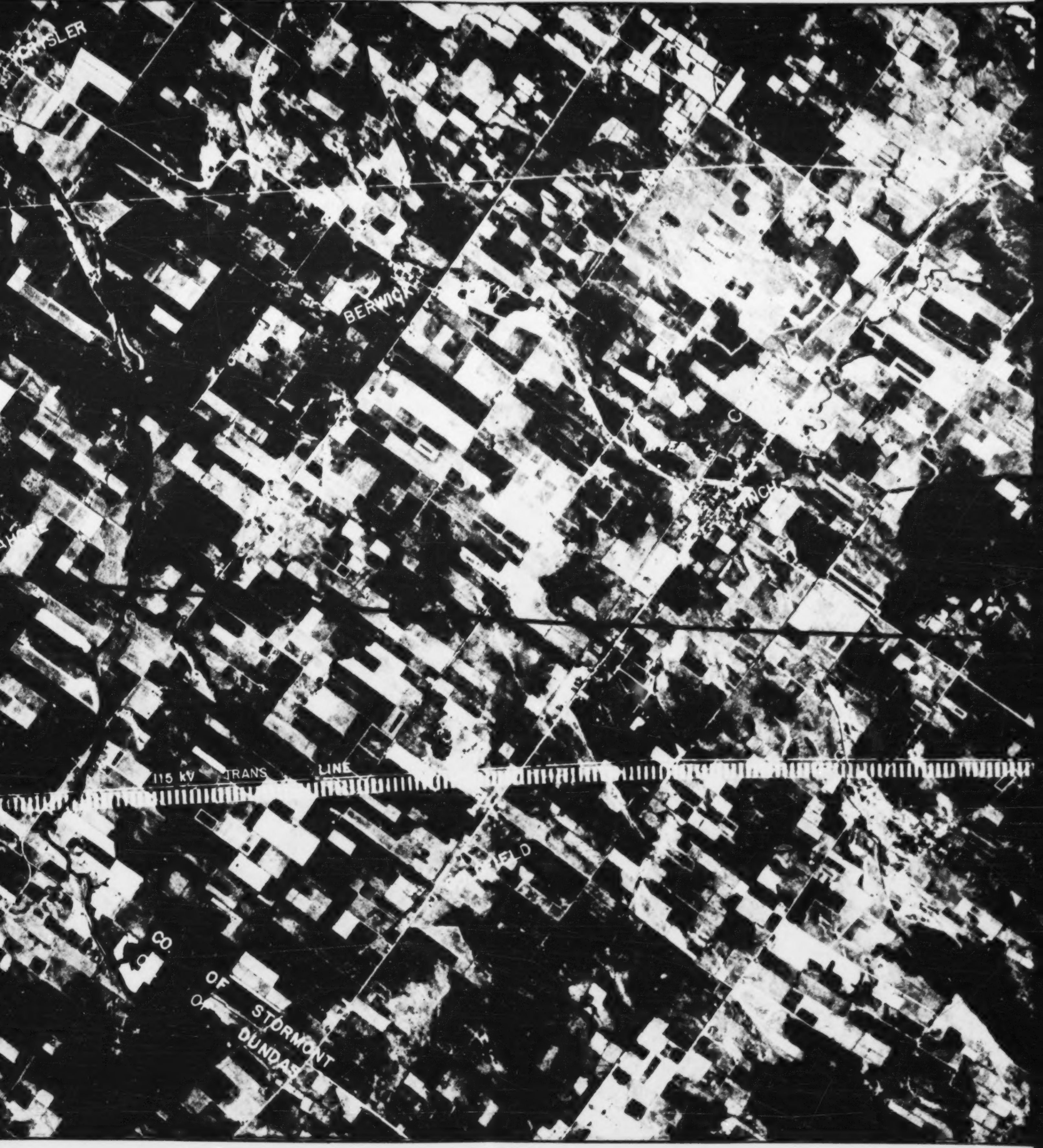
No recreational facilities are crossed. The towers would be within the viewshed of recreational features within the Mer Bleue Conservation Area and also the proposed Ramsayville Marsh foot trails and interpretation centre, which is an extension of the existing Mer Bleue development.

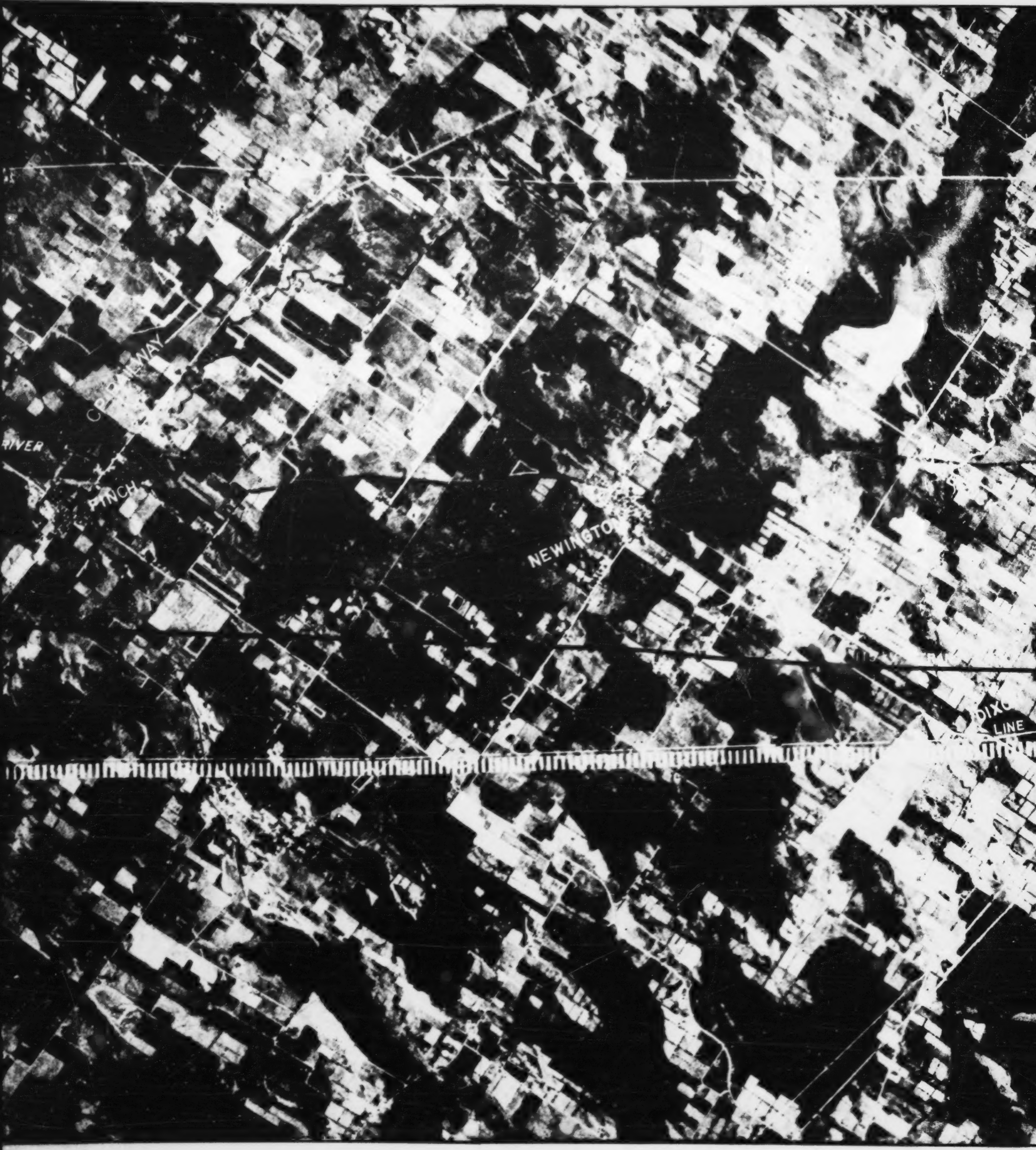
6.4.2.2 Socio-Economic and Public Involvement

The following evaluation provides a perspective on the socio-economic environment through which the existing 115 kV transmission line route passes. It is a broad


ST.
RUSSELL
TWP. OF OSGOODE
TWP. OF RUSSELL
MARVELVILLE
KENMORE
FELTON
RIVER
115KV TRANS
Q73 X 72
MARIONVILLE
CASTOR


TWP.
TWP.
230 kV TRANS LINE
NA69 X 10
FORGET
CANNAMORE
TRANS LINE
Q21 X 7
NORTH WINCHESTER
TWP.
TWP.
OF
OF
FINCH
WINCHESTER
MOREWOOD
CHESTERVILLE TS


CRYSLER
BERWICK
C
NCH
115 kV TRANS LINE
IELD
CO.
OF STORMONT
OF DUNDAS


C P RAILWAY
RIVER
FINCH
NEWINGTO
DIXO
LINE

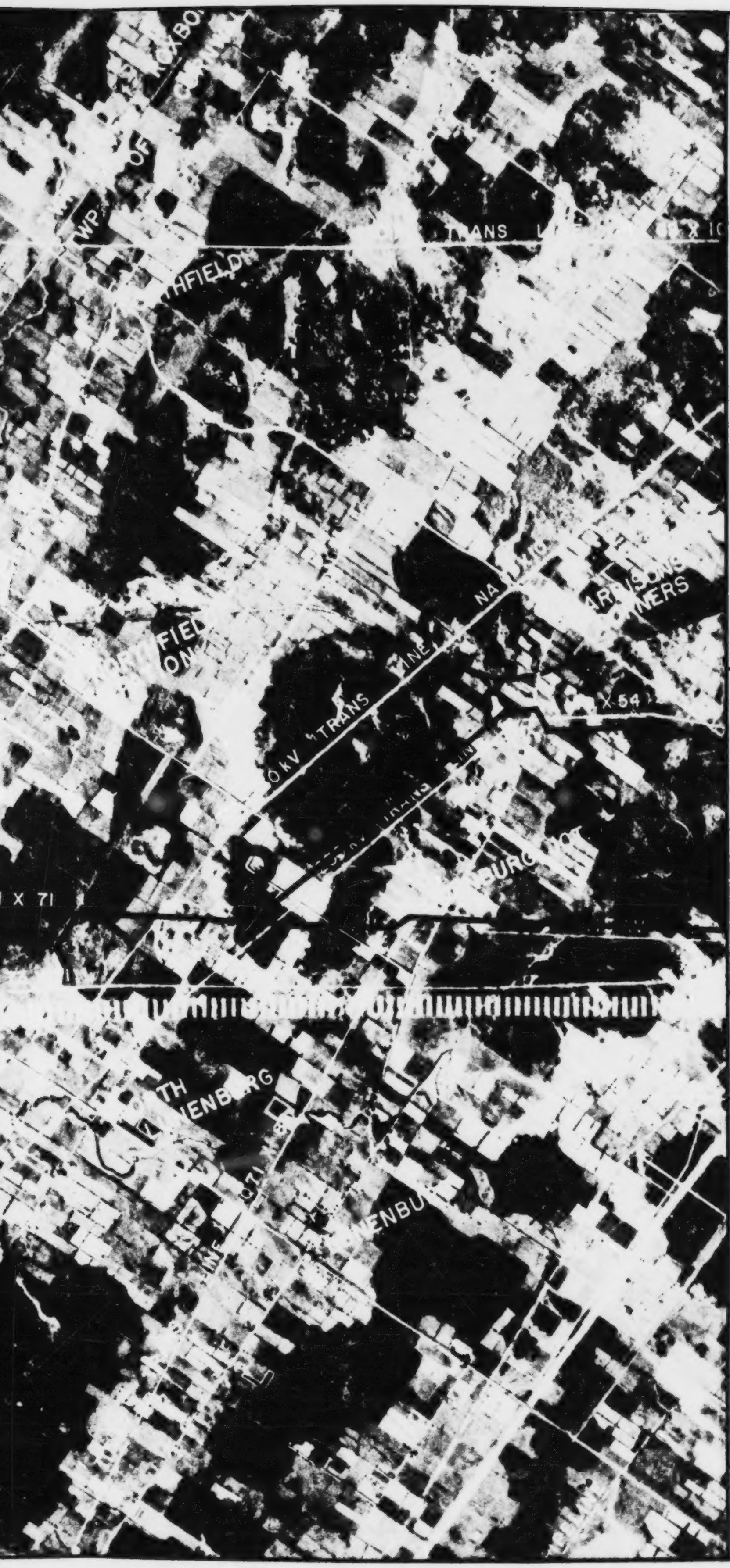

TWP OF
TRANS
NORTHFIELD
NORTHFIELD
54
TRANS LINE
X 71
HARRISONS CORNERS
NORTH WILLIAMSBURG

Figure 6.6

115 kV Transmission Line Route
Point G to Point P

Legend

||||||||| Study Area Boundary

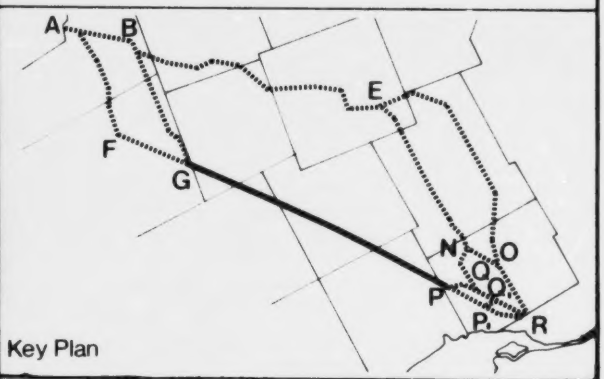
——— Alternative Routes

A Route Intersections

* Proposed Microwave Radio Station Site

Note:

Alternative routes are not drawn to scale.
All boundaries are approximate.


A
B
E
F
G
N
O
O
O
P
P
R

Key Plan

MF Roll No.	Rev.	Date	Particulars	Drawn	App'd.

Ontario Hydro

Design and Development Divsion -
Transmission

Drawn by K. Kolyn	Supervising Planner David Burzynski
Date Jan. 1985	Supervising Project Engineer
Work Order 840-03016	Graphics Prod. Supervisor

Scale	Drawing No.	Rev.	Sheet
1:50,000	RS-170-LUEP-RA6-005C	0	5 of 5

perspective relying on township-based rather than route specific information. Additional information is provided in Appendix B6.6.

In terms of ability to handle change, the populations of the municipalities along the existing 115 kV transmission line route are younger than the 1981 provincial average with the exception of Osnabruck Township. Three townships - Osgoode, Winchester, and Finch grew at the same rate or slower than the provincial growth rate in the 1976 to 1981 period. Slightly more than half of the townships encouraged residential development.

Relative to the compatibility of a transmission line with the community, municipalities along the existing 115 kV transmission line route have a somewhat smaller urban population, a larger farm population and less rural estate development than the Highway 417 route. The commercial/industrial/business assessments in the townships affected by this route, as a percentage of the total assessment, ranged from 9.1 percent to 46 percent.

With respect to economic base change, municipalities along the existing 115 kV route would experience slightly less change because of the reduction in the requirement for new right of way. This opportunity is afforded by the use of the existing 115 kV right of way from point G to point P in the Townships of Osgoode, Russell, Winchester, Finch and Osnabruck and the 230 kV right of way from point Q to point R in Cornwall Township. In addition, the disturbance to existing farm and forestry operations over the long term is minimized due to the removal of the existing line prior to building the 500 kV transmission line. More farm properties would be affected than the Highway 417 route.

Relative to social/lifestyle change, this route would not significantly increase access in any of the affected townships as the new line would replace the existing 115 kV transmission line for most of its length. Although there was discussion with the public about the perceived incompatibility of transmission lines with agricultural communities the opportunity to first remove the 115 kV transmission line between points G and P, to reconsider tower placement and tower types used on agricultural properties, and the re-negotiatate compensation with owners, should tend to minimize the intrusive effect.

Public comments focused on the effects on:

- agricultural land, particularly tile drained land in Osgoode, Russell, and Finch townships;

- agricultural operations (inconvenience of towers) in Winchester, Russell, Finch and Cornwall townships; and

- woodlots and forested areas in Osnabruck and Cornwall Townships.

In addition, public comments indicated:

- a preference for the use of narrow-based towers in agricultural land;

- a preference for location of towers on fence rows in active fields;

- agreement with the concept of removing an existing transmission line and widening an existing right of way instead of construction of a transmission line on a new route.

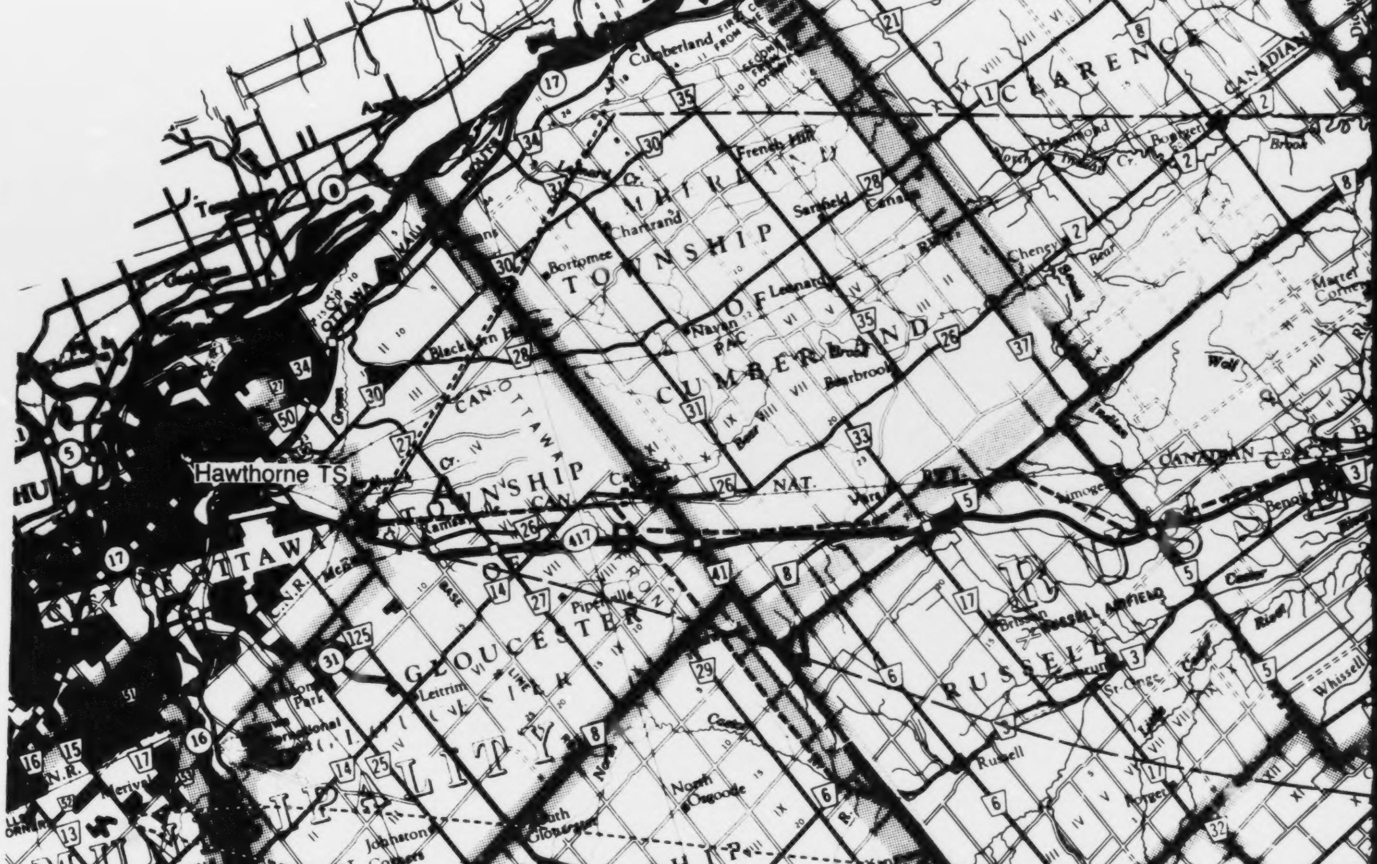
6.4.2.3 Cost/Technical

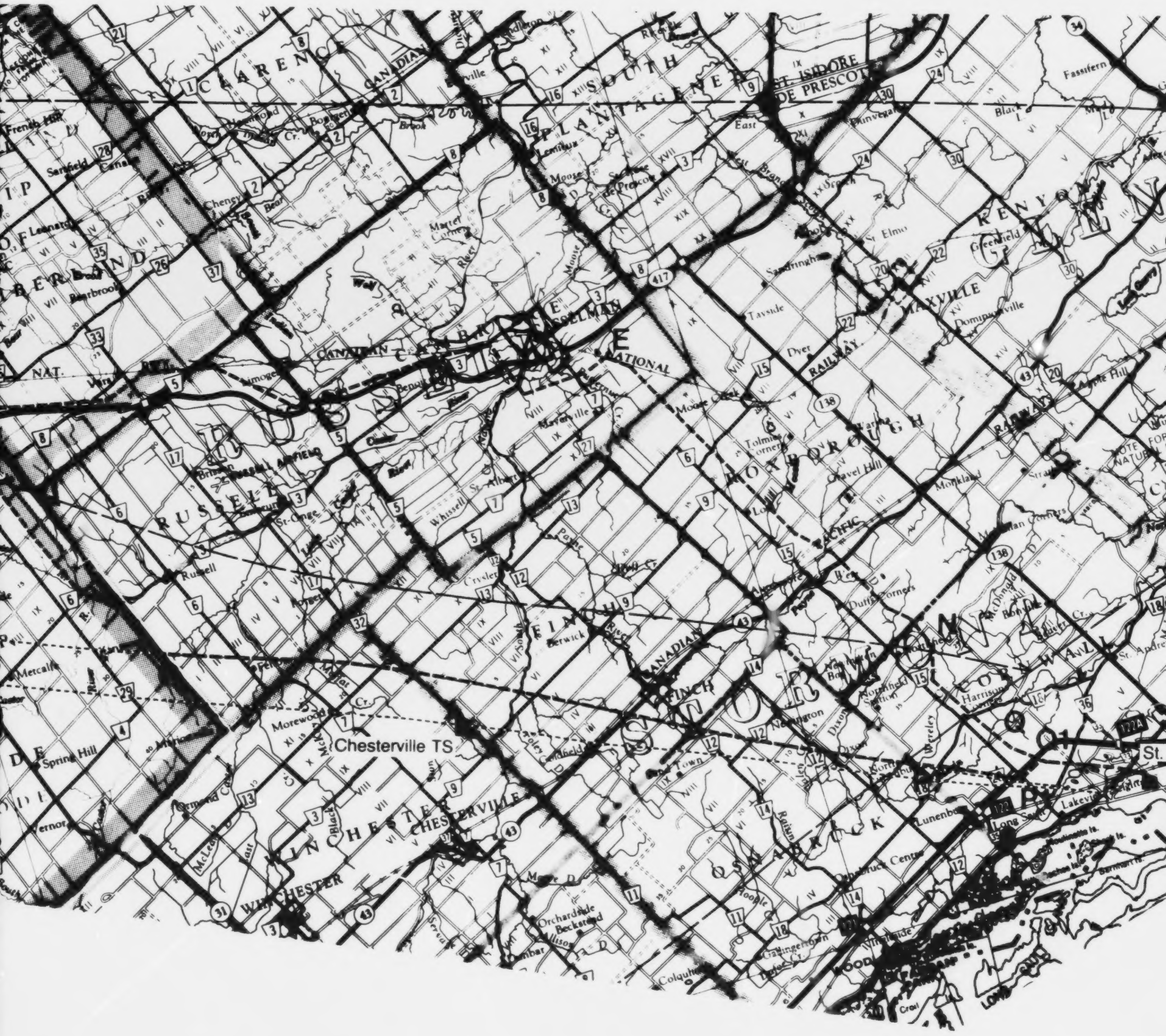
The estimated cost to build a single circuit 500 kV transmission line along the 115 kV route is $36.9 million. This cost estimate includes the extra costs involved in remedial work required to correct interference on telecommunications facilities operated by CN and Bell Canada where there are close parallels with these facilities between Hawthorne TS and point B. Also included in the cost estimate are higher tower foundation costs along 21.1 km of the route where deep leda clay deposits are crossed (refer to Table 6.1).

The 115 kV route crosses 49.1 km of active agricultural land. The use of narrow base lattice towers on this route has the potential to increase the cost estimate by approximately 13 percent. Soil conditions may prohibit the use of narrow base tower footings in areas of deep leda clays.

6.5 Comparison of Alternative Routes

A comparison of the two alternative routes, the Highway 417 route and the 115 kV transmission line route, was carried out based on the land use, environmental, socio-economic, technical and cost information described in the previous sections of Chapter 6. The results of the comparison are presented in Chapter 7.


Hawthorne TS
Chesterville TS
Cumberland
TOWNSHIP OF CUMBERLAND
CLARENCE
GLOUCESTER
TOWNSHIP
RUSSELL
Russell
OSGOODE
Metcalfe
Spring Hill
Vernon
North Osgoode
Navan
French Hill
Sarsfield
Leonard
Bearbrook
Chartrand
Bottomee
Pipeville
Leitrim
Johnstone Corners
Greely
Morewood
WINCHESTER
Embrun
Cheney
Limoges
Dalmeny
Manotick
CARLETON
NEPEAN
MUNICIPALITY


Chesterville TS
CLARENCE
SOUTH PLANTAGENET
ST. ISIDORE DE PRESCOTT
KENYON
MAXVILLE
ROXBOROUGH
RUSSELL
FINCH
WINCHESTER
CHESTERVILLE
OSNABRUCK
CORNWALL
CANADIAN NATIONAL RAILWAY
CANADIAN PACIFIC
Russell
Crysler
Berwick
Morewood
Moose Creek
Tayside
Dyer
Monkland
Dominionville
Greenfield
Fassifern
Dunvegan
St. Elmo
Sandringham
Tolmie's Corners
Gravel Hill
Duffs Corners
Newington
Lunenburg
Long Sault
Lakeview Heights
Osnabruck Centre
Ingleside
Colquhoun
Orchardville
Beckstead
Dunbar
Allison
Winchester
Vernon
Metcalfe
Spring Hill
Bearbrook
Sarsfield
French Hill
Cheney
Limoges
St. Albert
Whissell
Mayerville
Payne
Harrison Corners
Northfield Station
Dixon
St. Andrews
Mountain
Orsmond

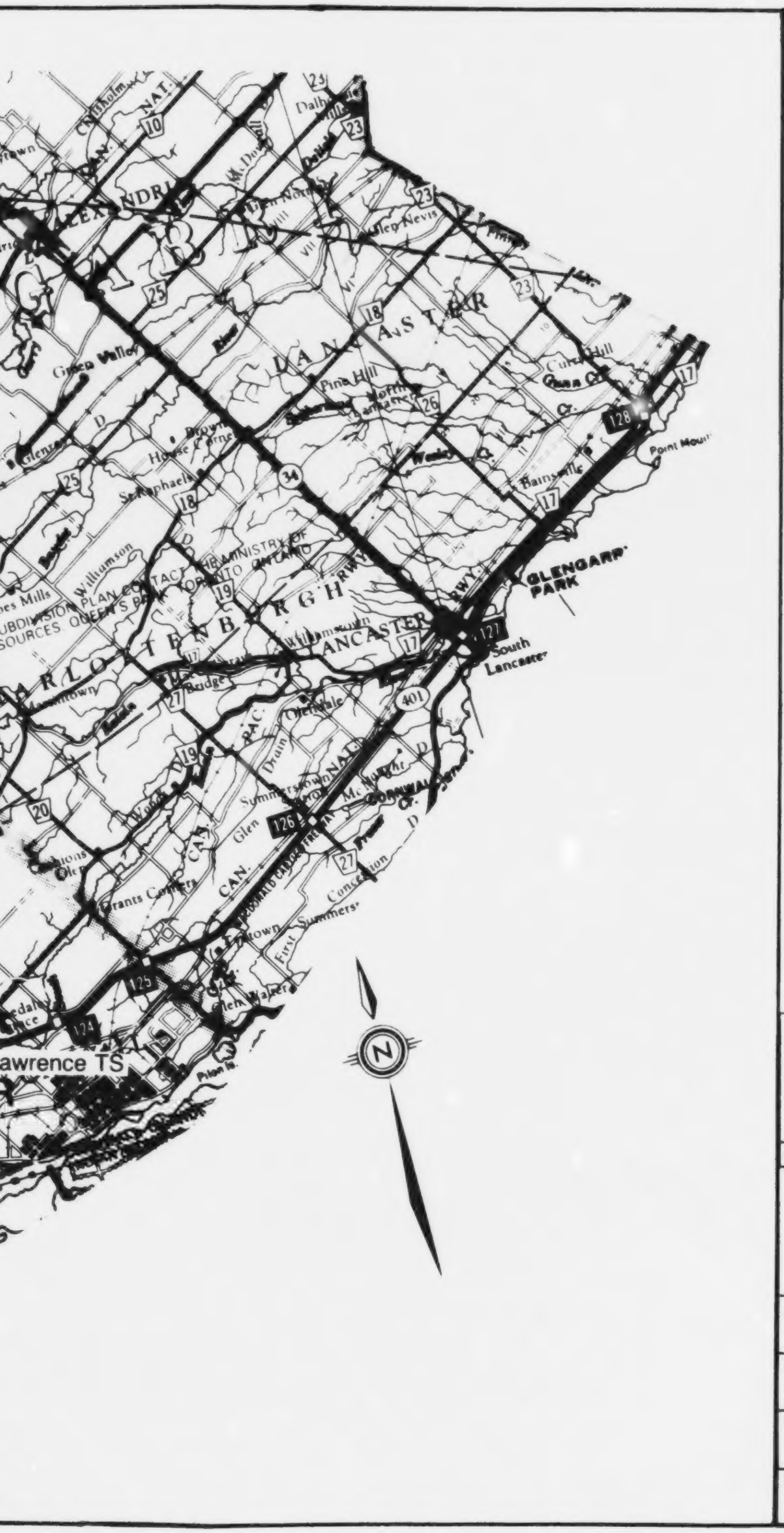

LANCASTER
ANCASTER
GLENGARRY PARK
South Lancaster
Bainsville
Curry Hill
Pine Hill
Green Valley
Summerstown
Grants Corners
awrence TS
N
401
17
23
18
34
19
25
26
27
128
127
126
125
124
20
10

Figure 6.7
Alternative Routes in Final Comparison

Legend

— —	Existing 230 kV Line
- - - - - - - -	Existing 115 kV Line
■	Transformer Station TS
-·-·-·-	Alternative Routes
A	Route Intersection

Note: Alternative routes are
not drawn to scale
All boundaries are approximate

MF Roll No	Rev	Date	Particulars	Drawn	App'd

Ontario Hydro
Design and Development Division -
Transmission

Drawn by K. Kolyn	Supervising Planner
Date March 1985	Supervising Project Engineer
Work Order 840 03016	Graphics Prod. Supervisor D. Henderson

Scale	Drawing No	Rev	Sheet
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Table 6.6
Final Alternative Route Comparison

FACTOR	Data Types	115kV Line Route	Highway 417 Route
	Length (km)	78.1	84.0
AGRICULTURAL RESOURCES	Area of tower base in grain & forage crops (ha)	2.5	4.6
	Land in tile drainage (km)	14.4	9.6
	Area of tower base in pasture land (ha)	0.3	0.7
	Length of agricultural land crossed (km)	49.1	35.6
APPEARANCE OF THE LANDSCAPE	Landscape types crossed (km)		
	- Natural	-	1.1
	- Flat untreed farmland	22.0	16.0
	- Rolling farmland (fields and woodlots)	50.5	41.7
	- Abandoned farming	4.9	24.5
	- Urban	10.7	0.7
	Number of crests affected	14	11
	Number of long views	6	10
	Number of road crossings	52	42
	Number of homes within the primary viewshed of the line (2km either side of the line)	1255	1252
BIOLOGICAL RESOURCES	Sensitive/significant biological areas (ha)	-	-
	Deer concentration areas (ha)	-	6.6
	Primary upland wildlife habitat (ha)	39.1	139.1
	Secondary upland wildlife habitat (ha)	27.7	11.7
	Wetlands with: - high biological value (ha)	-	14.1
	- medium biological value (ha)	-	2.6
	- low biological value (ha)	-	5.9
	Number of vegetated stream/river crossings	4	3
FOREST RESOURCES	Area of sugar bush or semi-mature upland hardwood stands (FRI site classes 1 and 2) (ha)	0.6	6.4
	Area of forest management (young or semi-mature), mature/semi-mature upland hardwoods (FRI site classes 3 or 4) or semi-mature conifer or mature lowland hardwood stands (FRI site classes 1 or 2) (ha)	9.9	7.8
	Area of forest management (new growth), young /immature upland hardwoods, mature lowland hardwoods (FRI site classes 3 or 4) or semi-mature conifer stands (FRI site classes 3 or 4) (ha)	34.7	59.8
	Area of young pioneer hardwoods, conifers or lowland hardwood or mature conifer or scattered stands (ha)	37.2	109.2

Table 6.6
Continued

FACTOR	Data Types	115kV Line Route	Highway 417 Route
	Length (km)	78.1	84.0
HERITAGE RESOURCES	Length of line crossing historic cultural landscapes (km)	65.1	49.0
	Number of known archaeological sites	-	-
	Area of reported but unsubstantiated and high archaeological site potential (ha)	22.9	40.0
HUMAN SETTLEMENT	Number of permanent residential buildings		
	- removals	-	-
	- in proximity	6	4
	Number of farm complexes		
	- removals	-	-
	- in proximity	22	8
	Number of farm outbuildings		
	- removals	-	-
	Number of institutional, commercial or industrial facilities		
	- removals	-	-
	- in proximity	1	-
	Number of proposed industrial developments directly affected	-	-
	Number of proposed residential developments directly affected	-	-
	Number of properties affected	242	185
MINERAL RESOURCES	Licensed pits		
	- length crossed (km)	1.0	-
	- number crossed	4	-
	Licensed quarries		
	- length crossed (km)	0.4	0.1
	- number crossed	3	1
	Area of high aggregate potential, Granular "A" crushed (ha)	-	0.9
	Area of high aggregate potential, asphalt or concrete blending sand (ha)	-	-
	Area of high aggregate potential, Granular "B" or "C" (ha)	1.7	6.0
RECREATION RESOURCES	Number of recreational sites crossed	-	-
	Length within viewsheds of private campgrounds (km)	-	3.6
	Length within viewsheds of public parks (km)	4.3	5.9
	Length within viewsheds of foot trails (km)	10.2	9.7
ESTIMATED COST	Present worth in 1984 dollars (millions)	36.9	42.1

7.0 SELECTION OF RECOMMENDED ROUTE

7.1 Transmission Line Route

7.1.1 Selection Rationale

The results of the evaluation and comparison indicated that the 115 kV transmission line route (Figure 1.1), would have relatively low potential effects on most land use, environmental and socio-economic factors and be the least expensive to construct. The major reasons for its selection over the Highway 417 route are as follows:

- least cost and most direct route;
- least overall effect on active agricultural land;
- least effect on the forest resources;
- least effect on biological resources;
- least visual effects;
- least effect on the heritage resources;
- least effect on areas of aggregate potential;
- least effect on existing and proposed residential areas;
- right of way requirements are reduced and existing severances are used;
- low socio-economic effects;
- adheres closely to suggestions provided by the public.

The following provides more detailed information on the reasons for the selection of the recommended route.

Agricultural Resources

Advantages:

- less area in grain, forage and pasture land taken up by tower bases (2.8 ha versus 5.3 ha on the Highway 417 route) because there would be the same number or fewer towers located on active agricultural land between point G and point P as well as the removal of towers between Russell DS and point G;
- does not affect the area in Cambridge Township which has potential for use of aerial spraying;

Disadvantages:

- crosses more active agricultural land (49.1 km versus 35.6 km on the 417 route).

Appearance of the Landscape

Advantages:

- fewer people will see the line (residents and the travelling public);
- less contrast with the visual character of the landscape;
- crosses fewer major crests;
- less change to the landscape since an existing transmission line is replaced.

Disadvantages:

- more visible in open landscape versus more tree cover on the Highway 417 route.

Biological Resources

Advantages:

- no deer concentration areas affected versus 6.6 ha on the Highway 417 route;
- substantially less primary and secondary wildlife habitat affected (66.8 ha versus 150.8 ha on the Highway 417 route);
- no major wetlands affected versus 22.6 ha on the Highway 417 route.

Forestry Resources

Advantages:

- less sugar bush affected (0.6 ha versus 6.4 ha on the Highway 417 route);
- less total forest area affected (81.8 ha versus 176.8 ha on the Highway 417 route);

Disadvantages:

- slightly more agreement forest affected (9.9 ha versus 7.8 ha on the Highway 417 route).

Heritage Resources

Advantages:

- less area of high archaeological site potential (22.9 ha versus 48.0 ha on the Highway 417 route);

- less change to cultural landscapes since most of the route makes use of existing transmission line rights of way.

Disadvantages:

- crosses more historic cultural landscapes (65.1 km versus 49.8 km on the Highway 417 route).

Human Settlement

Advantages:

- rebuild of an existing transmission line from point G to point P, parallelling from point P to near point P_1 and use of the Ontario Hydro owned right of way from point Q_1 to point R reduces total right of way requirements.

Disadvantages:

- more rural and farm residences in proximity (28 versus 12 on the Highway 417 route) and commercial use in proximity (1 versus 0 on the Highway 417 route);
- more properties affected (242 versus 185 on the Highway 417 route);
- more diagonal easement rights required.

Mineral Resources

Advantages:

- less area of aggregate potential affected (1.7 ha versus 7.7 ha on the Highway 417 route).

Disadvantages:

- more pits and quarries crossed (7 versus 1 on the Highway 417 route), although a number on the 115 kV alternative are already crossed by a line which will be replaced.

Recreational Resources

Advantages:

- no existing recreational facilities affected;
- towers would be removed from the Village of Kenmore recreational area.

Disadvantages:

- visibility of the transmission line from the proposed recreational development around the Ramsayville Marsh.

Socio-Economic and Public Involvement

The townships along the 115 kV transmission line route would sustain less economic base change and social/lifestyle change because of the removal of the existing transmission line and use of the right of way. These townships would, however, be slightly less able to handle change as identified by the criteria-ability to handle change and compatibility with communities.

The 115 kV transmission line route adhered to the public suggestions to minimize disruption to agricultural land, residences to minimize effects on woodlots and forested areas.

Cost/Technical

The 115 kV transmission line route was the least cost route by $5.2 million since it was the shortest route and crossed less areas of deep leda clay. The use of narrow base towers may increase the cost by approximately 13 percent. The cost increase (compared to 9% for Highway 417 route) would not significantly affect the economic ranking of the two alternative routes.

7.1.2 Description of the Recommended Route

The recommended route is illustrated in Figure 1.1 and is described as follows:

- Hawthorne TS to Point B

  The route (10.5 km of new right of way) follows the south side of the CN railway through agricultural land under lease from the National Capital Commission. The long parallel of the railway (approximately 9 kilometres) will involve remedial costs to correct interference with the CN and Bell Canada communications facilities. The right of way required is approximately 65 m wide.

- Point B to Point G

  The route (16.4 kilometres of new right of way) crosses through a mixture of active agricultural land and forest. The majority of the route is located along either lot boundaries or at the mid-concession line in the active agricultural land. The right of way required is approximately 65 m wide.

- Point G to Point P

  The route uses an existing 115 kV transmission line right of way for 39.1 kilometres. The existing line, which is on a 30 m wide easement, will be removed and the single circuit 500 kV line built in its place. The existing easement agreement must be renegotiated and widened for a total right of way width of approximately 65 metres.

- Point P to Point P_1

  A short portion (about 1 kilometre) of the route, between point P and Lunenburg Jct., will involve replacement of the existing 115 kV transmission line as between points G and P. From Lunenburg Jct to point P_1 the route parallels the north side of the existing 115 kV transmission line. The total length of route is 5.2 kilometres through an area of forested land with some active agriculture and small gravel pits. Approximately 47 m additional right of way will be needed beside the existing 30 m wide easement.

- Point P_1 to Point Q_1

  This portion of the route follows the south side of the Highway 401 for 1.3 kilometres through a forested area. The new transmission line does not use any portion of the Highway 401 right of way where it parallels the highway. The right of way required is approximately 65 m wide.

- Point Q_1 to Point R (St. Lawrence TS)

  The route parallels an existing two circuit 230 kV transmission line using part of an Ontario Hydro owned right of way which is 75 metres wide. An additional width of approximately 12 m of right of way will be acquired on the west side for this 5.6 kilometre long route. The proposed route crosses through an area of forested land with some active agriculture and rural residential development.

Typical tower designs are shown in Figures 7.1 and 7.2. Except for certain agricultural land, all suspension structures and angle structures would be conventional four footing lattice towers (Figure 7.1). It is proposed that, where possible, narrow base lattice towers (Figure 7.2) would be used for suspension structures located in open cultivated fields in Class 1 to 4 land in accordance with criteria established by Ontario Hydro and the Ontario Federation of Agriculture (see Section 7.1.3, Volume I).

7.1.3 Summary of Potential Effects and Mitigation

Environmental changes or effects would result from the construction of the 500 kV transmission line on the recommended route. Ontario Hydro would endeavor to minimize the extent and duration of these effects through the application of appropriate mitigation and restoration measures. These measures would be applied in accordance with Ontario Hydro's "Construction and Site Restoration Guidelines for Transmission Facilities, March 1981", approved by the Minister of the Environment. These include a broad range of mitigation, restoration and/or compensation measures which would be applied as necessary and appropriate.

Specific areas along the recommended route for which mitigation measures are being considered are described in Appendix B9 and include the following:

- Active Agricultural Land

  The number of narrow base towers which would be used on active agricultural land will be determined by applying the guidelines agreed to by the Ontario Federation of Agriculture (Volume I, Section 7.1.3). The potential effects on agricultural operations would be reduced by the use of these towers in areas where it is possible to install the single footing foundation.

- Ramsay Creek

  Access roads that are off the right of way and special considerations in tower placement could be required to minimize effects to the watercourse and associated floodplain areas.

- Proposed Ramsayville Marsh recreational development

  Mitigation will be discussed with the National Capital Commission.

- North Castor and South Nation Rivers

  Special considerations may be required in paralleling and crossing the North Castor River and crossing the South Nation River.

7.1.4 Public Review of Recommended Route

In March, 1985, the recommended route and alternatives considered will be presented to the public through a series of MPCs. These centres will be held for each municipality involved in the route stage study area, and will be conducted so that elected officials and property owners can obtain more specific information about the recommended and alternative routes. Public comments on the routes will be recorded and considered.

The members of the Regional Committee will be informed of the recommended route and an opportunity will be provided for them to give their comments.

7.2 Transformer Stations

The terminal points for the transmission line route for the east section of the study are St. Lawrence TS in Cornwall and Hawthorne TS in Ottawa. Both points are existing Ontario Hydro transformer stations. The additional property rights at Hawthorne TS will be acquired when the first line is built from Lennox GS (west section). For more information, refer to Volume I, Section 7.2, page 28.

The proposed area where facilities will be installed at St. Lawrence TS is shown on Figure 7.3. The work at St. Lawrence TS involves installation of additional 230 kV switching equipment, a 500-230 kV transformer and telecommunications facilities. A photograph of the existing transformer station is shown on Figure 7.13 in Volume I.

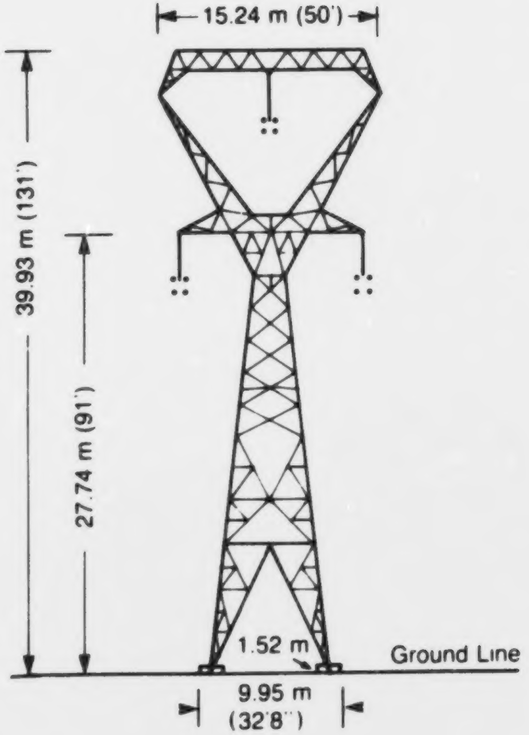

15.24 m (50')
39.93 m (131')
27.74 m (91')
1.52 m
Ground Line
9.95 m
(32'8")

Figure 7.1
500 kV Single Circuit
Conventional Lattice Tower

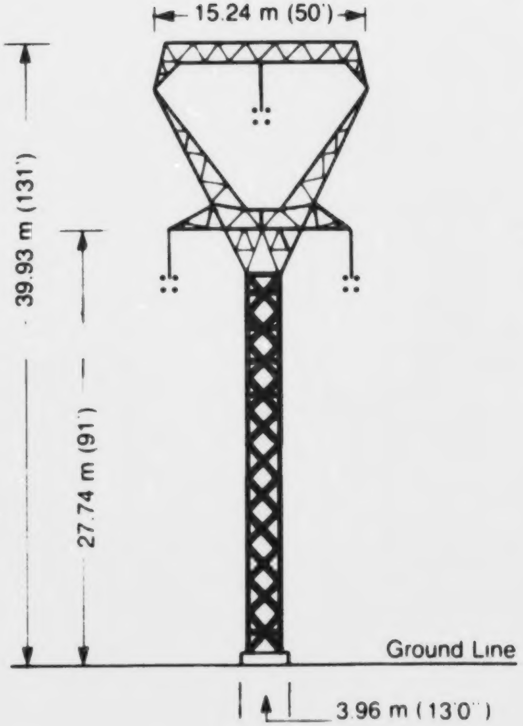

15.24 m (50')
39.93 m (131')
27.74 m (91')
Ground Line
3.96 m (13'0")

Figure 7.2
500 kV Single Circuit
Narrow Base Lattice Tower

RS-170-LUEP-RA6-0050

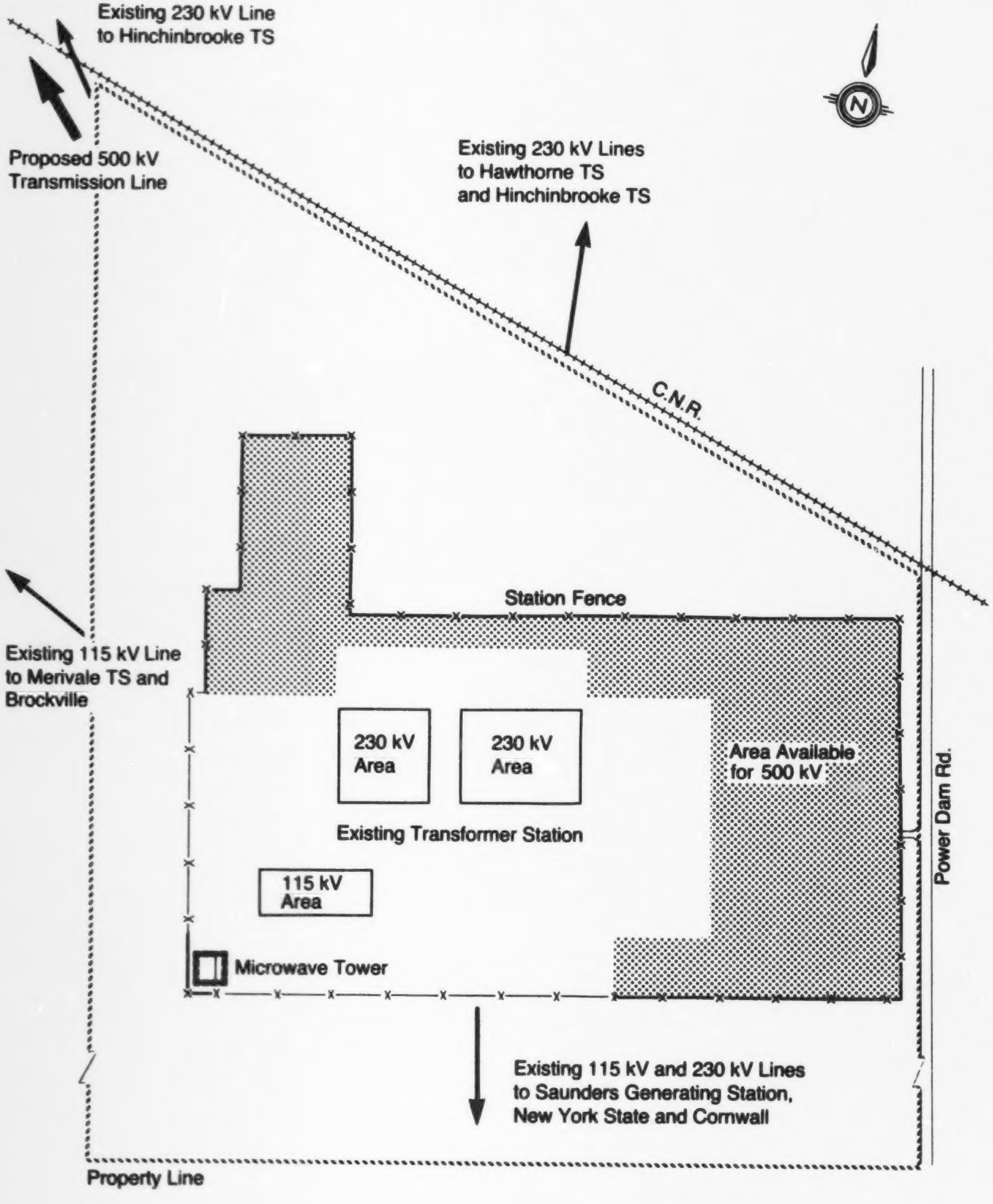

Existing 230 kV Line
to Hinchinbrooke TS
Proposed 500 kV
Transmission Line
Existing 230 kV Lines
to Hawthorne TS
and Hinchinbrooke TS
C.N.R.
N
Station Fence
Existing 115 kV Line
to Merivale TS and
Brockville
230 kV
Area
230 kV
Area
Area Available
for 500 kV
Existing Transformer Station
115 kV
Area
Microwave Tower
Power Dam Rd.
Existing 115 kV and 230 kV Lines
to Saunders Generating Station,
New York State and Cornwall
Property Line

Figure 7.3
St. Lawrence T.S.
Area Available For Additional Facilities

8.0 POST APPROVAL ACTIVITIES

Following approval by the Joint Board, Ontario Hydro would proceed to refine the location and design of the transmission line and determine the specific methods of construction and mitigation. Consultation with directly affected parties would be carried out prior to preparation of final design plans and then property acquisition would be undertaken. After possession of the necessary property rights is obtained, construction would begin together with environmental monitoring.

The following sections describe the post-approval activities in more detail.

8.1 Transmission Line Route Finalization

A right of way plan would be prepared by Ontario Hydro from orthophotos with field surveyed ground control, at a scale of 1:4,000, showing the transmission line route. The precise location of the centre line would be defined taking into account any conditions of route approval set out in the decision of the Joint Board.

8.2 Information Centres for Affected Property Owners

After the right of way plan has been produced, Ontario Hydro would hold a series of information centres for affected property owners. At these centres, various Ontario Hydro personnel would be present, representing such areas as engineering, environment, real estate and construction, in order to answer questions the property owners might have, and to consider their concerns.

Following the centres, individual property owners would be personally contacted and advised of the process followed for acquiring property rights. In addition, the tower types and locations would be discussed and permission will be requested to enter their land for surveying, soil testing and property appraisal. At the request of affected property owners and subject to agreement of Ontario Hydro, minor adjustments could be made to the right of way plans at this time. Ontario Hydro would request the Joint Board to maintain jurisdiction to make necessary adjustments.

Prior to beginning field activities, each owner would be given the name of the Ontario Hydro representative who would co-ordinate property owner contacts regarding surveys, property rights acquisition, soil testing, construction and restoration practices.

8.3 Final Design

Final engineering plans would be based on additional site specific environmental and engineering data collected in the field, and through consultation with property owners, provincial ministries, and land use permit holders. These engineering plans would identify the tower locations, access roads, and construction staging areas. The plans would also identify environmentally sensitive areas and the proposed mitigation. Archaeological surveys and reports would be produced for those areas where high archaeological potential has been indicated. The Ministry of Citizenship and Culture, Regional Archaeologist would be consulted to assist in determining areas of high archaeological potential.

Prior to construction, the following documents would be filed with the Ministry of the Environment, both in the Public Record in its offices at 135 St. Clair Avenue West, Toronto, Ontario, and with the Director, Southeastern Region, Ministry of the Environment, 133 Dalton Street, Kingston, Ontario:

(i) Pre-Construction Access Route Plan

This plan will show the proposed location of each tower site and access road to be used for construction, forestry, and in some cases, maintenance activities. In addition, it would show any environmentally sensitive areas, specify any special mitigation techniques and identify noise sensitive areas and all known water wells within and in close proximity to the proposed right of way.

(ii) Construction Schedule

This schedule will indicate when Ontario Hydro plans to carry out the major activities.

8.4 Property Acquisition and Compensation

The consolidated approval process adopted for this application incorporates the question of whether, under the Expropriations Act, the taking is fair, sound, and reasonably necessary. If this undertaking is approved by the Joint Board, and subject to obtaining an Order-in-Council under the Power Corporations Act, Ontario Hydro would be required to expropriate all lands required for the facilities.

During the course of the completion of the final design plans, expropriation of the lands required would be completed by the registration, by Ontario Hydro, of a plan of expropriation under the Expropriation Act. In the circumstances of this application, the Joint Board is the approving authority.

Acquisition of all property rights required for the undertaking would be carried out in accordance with Ontario Hydro real estate acquisition policy. In most cases, only easement rights would be acquired for the transmission line right of way, except where an owner elects to sell Ontario Hydro the fee (full ownership) for the right of way and a severance would be acceptable to the municipality.

If, after a reasonable period of negotiation, an agreement cannot be reached on compensation, the assistance of a Board of Negotiation, appointed by the Lieutenant-Governor-in-Council, could be requested by either Ontario Hydro or the property owner. Its recommendation would not be binding and if an agreement still could not be reached, either party could ask the Ontario Municipal Board to arbitrate a settlement. The decision of the Ontario Municipal Board would be binding on both parties unless appealed within 30 days.

Any land purchased by Ontario Hydro which becomes surplus to its needs could be disposed of by sale. Certain potential purchasers such as the previous owner or government agencies would be given priority to acquire the surplus property, following which the property would be offered for public sale by public tender, public auction, through a real estate broker or by direct sale.

8.5 Construction Activities

Construction of the transmission line would follow the 'Construction and Site Restoration Guidelines for Transmission Facilities, March, 1981', approved by the Minister of the

Environment. These guidelines would be used by all personnel involved in the design, construction and maintenance of transmission lines in order that the work would be accomplished without causing undue adverse environmental changes. The guidelines would apply whether the work is carried out by Ontario Hydro or by contracted forces.

Construction operations during installation of a transmission line are generally of short duration and at intermittent locations along the route of the line. Ontario Hydro is committed to follow the Protocol for Community Noise Control during the construction of transmission lines and all related facilities such as transformer stations (as agreed between the Ministry of the Environment and Ontario Hydro). These transmission facilities are designed according to the standards noted in the Protocol.

The construction equipment is operated in accordance with sound emission standards as referenced in the Model Municipal Noise Control By-law. The condition of the machines is monitored by our forces in order to comply with worker safety standards since noise is considered a designated substance.

The hours of work for construction comply with the requirements in the Model Municipal Noise Control By-law. Ontario Hydro practice is to carry out construction, operation and maintenance according to the Model By-law in all areas, even if the local municipality has not enacted the Model By-law.

It would be mandatory that crew briefings on minimizing environmental damage take place prior to the commencement of field work. Environmentally sensitive areas would be managed according to the special mitigation measures outlined in the Construction Access Plan.

During all construction phases, Hydro establishes and maintains a cooperative relationship with the affected property owners and tenants. This helps ensure that the owner is kept informed, in advance, of activities occurring on his or her land, and whom to contact for advice or information. It also ensures that construction and forestry crews are kept informed of the particular wishes and concerns of the landowner. Contact would also be maintained with the local MPs, MPPs, municipal officials, Regional Committee members and others on the study mailing list throughout the construction phase of the project by means of letters, status reports, announcements and field visits. News releases would be issued at significant stages to inform the local public of the project's status.

As construction proceeds, the plans filed with the Ministry of the Environment would be monitored closely. Due to many factors such as property owner preference, material supply delays, and weather conditions, the actual field construction could vary from the plan. The actual conditions which occur on site, and the deviations from the proposed mitigation measures, would be noted. Following completion of construction and the initial restoration phase of the right of way, any changes would be noted on the Construction Access Plan and this revised plan would be filed with the Regional Director and on the public record at the Ministry of the Environment as an 'as constructed' plan.

8.5.1 Planning and Specifications

Land surveys would be carried out to establish the limits of the right of way and to stake out tower locations. Geotechnical investigations would be carried out at each high voltage transmission tower site involving overburden. The purpose of this work is to determine the groundwater regime and subsoil conditions so that appropriate engineering design and construction can take place.

Consideration of the groundwater system is a key part of this work as is long term performance, and Ontario Hydro's intent to avoid disturbance to the environment. The provision of individual engineered foundations on a tower by tower basis is a practice which Ontario Hydro adheres to and which has enabled us to avoid groundwater disturbance.

Design would be carried out and construction specifications would subsequently be issued for construction of the station and transmission facilities. These specifications would include information on:

- engineering detail;
- construction methods to be used in sensitive environmental areas; and
- selective cutting and restoration specifications.

8.5.2 Warehousing Yards

Temporary warehousing yards would be established every 30-50 km along the line and would be used to store construction materials and equipment, package material for delivery to tower sites, and assemble foundation reinforcing steel cages. Field office trailers or portable buildings would also be located at the yards.

8.5.3 Selective Cutting

Selective cutting would involve the removal of any tree(s) that could adversely effect the construction and safe operation of the transformer station and transmission line. The long-term goal would be to create and maintain a vegetative cover that is compatible with the overhead conductors and with the general operation of the transmission line.

Depending on the type, density and species of trees present, the clearing required through a wooded area on the right of way could be substantial (virtually clear cut) or minimal. Exclusion zones for stump spraying will be identified on the Pre-Construction Access Route Plan

The landowner would have the option of retaining ownership of the felled wood or accepting payment for it. Marketable wood owned by Ontario Hydro would be sold by tender. Brush and non-marketable wood would be burned, chipped, left in brush piles or removed from the right of way.

Stumps could be sprayed as required to prevent sucker growth. Only government approved herbicides would be used and these would be applied under the direction of licensed supervisors.

8.5.4 Access Roads

Access roads would be required to enable vehicles, equipment and materials to reach the work sites along the right of way. They would be generally 4.6 m wide and capable of supporting the heavy equipment that would be used to deliver equipment and materials, construct tower foundations, assemble towers, and string the conductors. Mobility of the equipment, environmental factors, land use, cost, and owner preferences would all be taken into consideration when determining the location of the access roads.

Wherever possible, access roads would be kept within the right of way. On agricultural land, the preference would be to use existing farm lanes and field access roads (with the upgrading of such by spreading gravel and/or improving stream crossings where necessary). Farm gates would be installed in existing fences, and both the owner/lessee and Ontario Hydro would keep keys to any locked gates.

In wetlands, gravel or corduroy roads could be used. Equalizing culverts could also be installed to control the build-up of water behind such roads.

The type of crossings used for ditches and streams would be determined on a case-by-case basis depending on the size of the waterbody, the period of use, water flow, location of the right of way and other factors. The waterbody could be bridged, forded, culverts could be installed or the crossing of the stream could be avoided all together depending on the environmental sensitivity. Water crossings and possible mitigation will be dealt with as sensitive areas in the Pre-Construction Access Route Plan or, where of minor concern, through our Construction & Site Restoration Guidelines.

8.5.5 Delivery of Materials

This would include the delivery of construction materials to the station site, to the temporary warehousing yards for storage and assembly, and to the individual work sites along the right of way.

Concrete would be delivered to individual tower sites by ready-mix trucks. Foundation reinforcing steel cages, prefabricated sections of tower steel, and tower hardware would be transported from the warehousing yards to the tower site via stake truck with self-loading cranes or by highway tractors and flat bed trailers. Transmission line conductor cables would also be delivered to the right of way by stake trucks or highway tractors and trailers. In wet ground conditions, a soft-track carrier with crane would be used to deliver materials to the work sites. Major electrical equipment, such as high voltage power transformers, would be transported by specially designed rail car and/or highway tractor with special heavy duty floats.

The use of existing municipal and regional roads would be discussed with the municipalities involved before specific delivery routes are determined.

8.5.6 Tower Foundations

In most cases, foundations required at each transmission tower location would consist of circular reinforced concrete structures up to 1.2 m in diameter and about 6.1 m deep. First a hole would be drilled into the ground to a specified depth and diameter using an augering machine. Then a pre-assembled reinforcing steel cage would be lowered into the hole, anchor bolts for the tower legs would be positioned, and the hole would be filled with concrete. On arable land, excess excavated soil would be removed from the site or located where the owner wishes. On non-arable land, the excavated soil would usually be spread around the tower site. If the augered hole fills with water during construction, a special clay (bentonite) would be pumped into the hole to remove excess water.

In bedrock areas, steel footings would be attached by drilling holes and grouting anchor bolts directly to the rock. No concrete foundations would be required. In wet areas and where poor soil conditions exist, specially designed foundations would be required that use screw anchors or piles driven deep into the ground.

8.5.7 Tower Assembly and Erection

After the foundation is completed, the tower would be assembled in sections on site. The tower would be bolted together using impact wrenches driven by a portable electric generator.

Using a small crane of up to 32 tonne capacity, the assembled sections would then be hoisted into position and bolted together. The upper portion of the tower would be erected using a larger crane of up to 114 tonne capacity.

A bulldozer would generally be required for ground leveling to ensure safe crane operation. Under unusual circumstances where the tower site would not be accessible by crane, towers could be erected using gin poles and helicopters. However, this method would be slow, weather dependent, and very costly compared to erection by crane.

8.5.8 Stringing of Conductor Cable

This would involve stringing the conductor cables out along the right of way and attaching them to the towers. The conductor cables for 500 kV transmission lines would be pulled under tension through travellers (pulleys) attached to each tower. Being under tension, the conductor cables would be kept off the ground at all times. This would avoid damage to the conductors and the right of way, the need to move heavy equipment along the full length of the right of way, and would allow for the selective cutting of the right of way.

The first step would be to use a helicopter to place an initial light pulling rope through the travellers suspended from each of the towers along the section of line to be strung. This rope would be then used to pull larger ropes and eventually the conductor cables through the travellers and into position.

Up to eight kilometres of line would be strung at a time. Special tensioning and puller equipment would be located in "set up areas" at either end of the section of line being strung. After the conductors are tightened to a specified tension, they would be clamped to each tower, then spacers and dampers would be installed. Rider poles would be installed at all road and rail crossings to prevent any interference with traffic. The rider poles will be removed after construction is complete.

8.5.9 Counterpoise

Counterpoise could be required at some locations. It would consist of burying galvanized steel wire on the right of way to reduce electrical ground resistance in areas of natural high electrical resistance (rocky or sandy areas). Low electrical ground resistance at tower locations would minimize the chance of operational line outages due to lightning.

A bulldozer with a slot-cutting plow would be used to bury the wire about 0.5 m into the ground. The wires could be buried along the right of way for the full length between towers or could extend a specified distance up and down the right of way from each tower.

8.5.10 Cleanup/Restoration

Cleanup/restoration would be the cleanup and rehabilitation of areas disturbed by construction activities.

A cleanup operation to remove surplus material and debris would follow each construction activity, and a final cleanup would be carried out when construction is completed.

Restoration could include replacing top soil, alleviating compaction, grading, grubbing, seeding, removal of temporary culverts and access roads and rip-rapping.

8.5.11 Project Schedule and Manpower Resources

i) Project Schedule

The Hawthorne TS to St. Lawrence TS transmission line is scheduled to be in-service as early as November 1990. In order to meet this in-service date, key activities would be as follows:

- submission of Environmental Assessment - March 1985;
- Order-in-Council, under the Power Corporation Act - March 1986;
- start of property acquisition - October 1986;
- earliest possible start of construction - January 1988;
- earliest possible in-service date - November 1990.

ii) Manpower Resources

An estimated 2,000 man-months would be required to build the transmission line, install facilities at St. Lawrence TS and Hawthorne TS and construct the microwave radio stations. This translates into a peak manpower requirement of about 380 workers over the construction period. The required construction skills would include: labourers, carpenters, operators, linemen, groundmen and forestry tradesmen.

All construction workers would be members of trade unions and therefore, would be employed in accordance with local agreements and union hiring practices.

Some of the equipment and materials would be purchased in eastern Ontario. There would be potential for local contracts, particularly for forest cutting and provision of sand, gravel and concrete. The extent of local contracts would only be known at the pre-construction stage.

There would be no construction camps associated with construction of the transmission lines. Construction workers would commute from Cornwall or Ottawa: there is limited hotel/motel accommodation along the route.

No additional maintenance personnel will be required.

8.6 Transmission Line Operation, Maintenance and Decommissioning

8.6.1 Right of Way Management

Right of way management activities would be undertaken to ensure that the transmission facilities on the right of way may be operated and maintained safely, reliably and efficiently. It would include activities such as periodic tree cutting and pruning, selective herbicide application, inspection patrols, soil stabilization as necessary, and encouraging productive secondary uses of Ontario Hydro owned property.

One management objective would be to eliminate vegetation which is incompatible with transmission line operation and maintenance, and to encourage stable compatible vegetation. Vegetation control methods used to achieve this objective comply with government legislation, consider site specific conditions (i.e., surface and ground water) and would be carried out by trained operators.

Exclusion zones for herbicide spraying during maintenance would be identified in a Right of Way Management Specification. This document would be formulated in consultation with affected government ministries, i.e., MOE (South East Region), MNR, Conservation Authorities, Municipalities and our regional personnel. The purpose of this specification is to carry through commitments to protect the environment from the planning and construction stages to the operation and maintenance stage and provide a sound management strategy.

8.6.2 Line Maintenance

Routine visual inspections would be made of transmission lines so that corrective action could be taken before an operating problem developed (i.e., damaged insulators, tower members, hardware and conductors). In rural areas, helicopter patrols would be done about three times a year and a ground patrol once every two years. Each line would be subjected to a climbing inspection by climbing a 10 percent random sample of the towers every 10 years.

Regular maintenance and emergency repairs would be carried out as required. Regular maintenance work could usually be scheduled well ahead of time and discussed with the land owners/lessees. In planning and executing regular or routine maintenance, a major consideration would be to limit the disruption to farm practices and the environment as much as possible. Where damage is unavoidable, restoration or compensation for the cost of restoration would be provided.

Emergency repairs would require immediate action to restore the facilities to service and the owners would later be compensated for any damage to the property or crops.

8.6.3 Secondary Uses

The granting of any new application for the secondary use(s) of right of way lands would have to be technically compatible with transmission facilities, meet public safety criteria and would be subject to the terms and conditions of Exemption Order OH-27, as outlined in the Procedural Document which was approved by the Minister of the Environment on April 6, 1983.

Secondary uses of lands owned by Ontario Hydro would generally be granted where they do not conflict with adjacent owners, where they are compatible with the local community and do not interfere with Ontario Hydro's existing and projected uses of the right of way. These compatible uses include a continuance of the present use(s), agriculture, market gardening, garden plots, nurseries, industrial storage, utility pipelines, parks, recreation facilities and parking lots.

8.6.4 Decommissioning

Experience with similar types of transmission lines indicates that the service life would be at least 50 years.

Decommissioning these lines would involve either replacement or abandonment. If the lines are replaced or upgraded, the construction activities and associated environmental impacts would be less than those covered in this document. If the lines are abandoned, construction activities would be limited to the removal of the conductors and towers.

Access would be required to the tower locations, and following the removal of the towers, the foundations would be cut off below grade and covered. The affected areas would be restored to a standard set out in Section 2.8 of the "Construction and Site Restoration Guidelines for Transmission Facilities", March, 1981. Ontario Hydro would then consider disposal of owned right of way to adjacent owners if it is deemed surplus to future requirements.

9.0 STUDY PROCESS - TELECOMMUNICATIONS

9.1 Overview

The recommended extension of Ontario Hydro's telecommunications system involves additional microwave radio as well as power line carrier (PLC) facilities. This section deals with the selection of sites for two microwave radio stations. No additional property is required for the PLC system.

Ontario Hydro's existing microwave radio system ends at Hinchinbrooke Switching Station (SS), north of Kingston. Volume II of this environmental assessment dealt with the extension of the system from this point to Hawthorne TS in Ottawa. This volume deals with a further extension of the system from Hawthorne TS to St. Lawrence TS where a terminal microwave radio station is required. One repeater station will be required to relay communications between these stations. No alternative to the St. Lawrence TS location was considered because of technical requirements.

The telecommunications site study was co-ordinated with the schedule of the transmission line route study. The main steps in the study process to select the recommended site for a microwave radio repeater station between St. Lawrence TS and Hawthorne TS were:

- identification of a study area;
- data collection and rating;
- development of constraint maps;
- identification of alternative sites; and
- evaluation, comparison and selection of a recommended site.

9.2 Public Involvement Programme

The objectives of the public involvement programme for the telecommunications study were:

- to provide information to those potentially affected by or interested in the study; and
- to provide opportunities for these people to participate at key study steps.

The public involvement programme was co-ordinated with the transmission line route study. The primary vehicle for public input was the series of MPCs held at key study steps. While general information on the telecommunications study was available at all MPCs, more detail information and maps were presented in those townships potentially affected by the study. Information was available at municipal offices and Ontario Hydro area offices. The programme also provided for contact with elected and appointed officials and the media. This aspect of the programme was coordinated with the transmission line study.

10.0 DEVELOPMENT OF A STUDY AREA AND CONSTRAINT MAPS

10.1 Development of a Study Area

As the recommended microwave radio system for the West Section of the Eastern Ontario Transmission Line Study ends at Hawthorne TS, it was necessary to identify a repeater station site between Hawthorne TS and St. Lawrence TS. Consequently, a study area was established between these two terminal points for the purposes of identifying alternative repeater station sites and ultimately selecting a recommended site (see Figure 10.1). For an explanation of how the study area was established see Appendix D1.

The study area is located in Winchester and Finch townships. Before identifying alternative sites, a wide range of land use and environmental resource information was assembled in order to gain a better understanding of the concerns and siting opportunities present. For a description of the significant land use and environmental features of the study area, refer to Appendix D2.

10.2 Constraint Maps

10.2.1 Development of Environmental Constraint Maps

Development of the environmental constraint maps for the study area began with the identification of environmental situations or resources that could be negatively affected by the construction and presence of a microwave radio station. The environmental situations selected fell within the same factor categories as in the transmission route study. The situations were rated into levels of high, medium and low environmental constraint. The ratings were based on the relative resource value and possible effects on each environmental resource. The environmental situations and their corresponding rated values are provided in Appendix D2. The rationale for the ratings is presented in Appendix D3.

The level of constraint identified within any given area represented the highest rated situation contained within that area. For example, if an area was rated high from a biological standpoint and medium from a mineral resources standpoint, the rating for that area would be high. Appendix D5 illustrates the environmental constraint areas associated with each of the environmental factor categories and includes a composite environmental constraint map.

10.2.2 Development of Technical Constraint Map

The technical constraints mapped were areas more than 0.4 km away from a year round access road. These areas were given a high level rating and a corresponding technical constraint map was produced (see Appendix D6).

10.2.3 Composite Environmental/Technical Constraint Map

The next step involved combining the environmental and technical constraint areas to produce a composite environmental/technical constraint map. Again, the highest level of constraint occurring in any given area was used to represent that area.

Figure 10.2 shows the composite environmental/technical constraint map for the study area. In the areas of lower constraint, localized areas of high constraint such as permanent and seasonal residences, small natural undisturbed environments and viewsheds of residences and recreational areas could still exist. These localized constraints would be recognized during the site identification and selection stages of the study.

The constraint mapping technique employed in this study allowed for the concentration of alternative site identification in areas of relatively lower environmental and technical constraint.

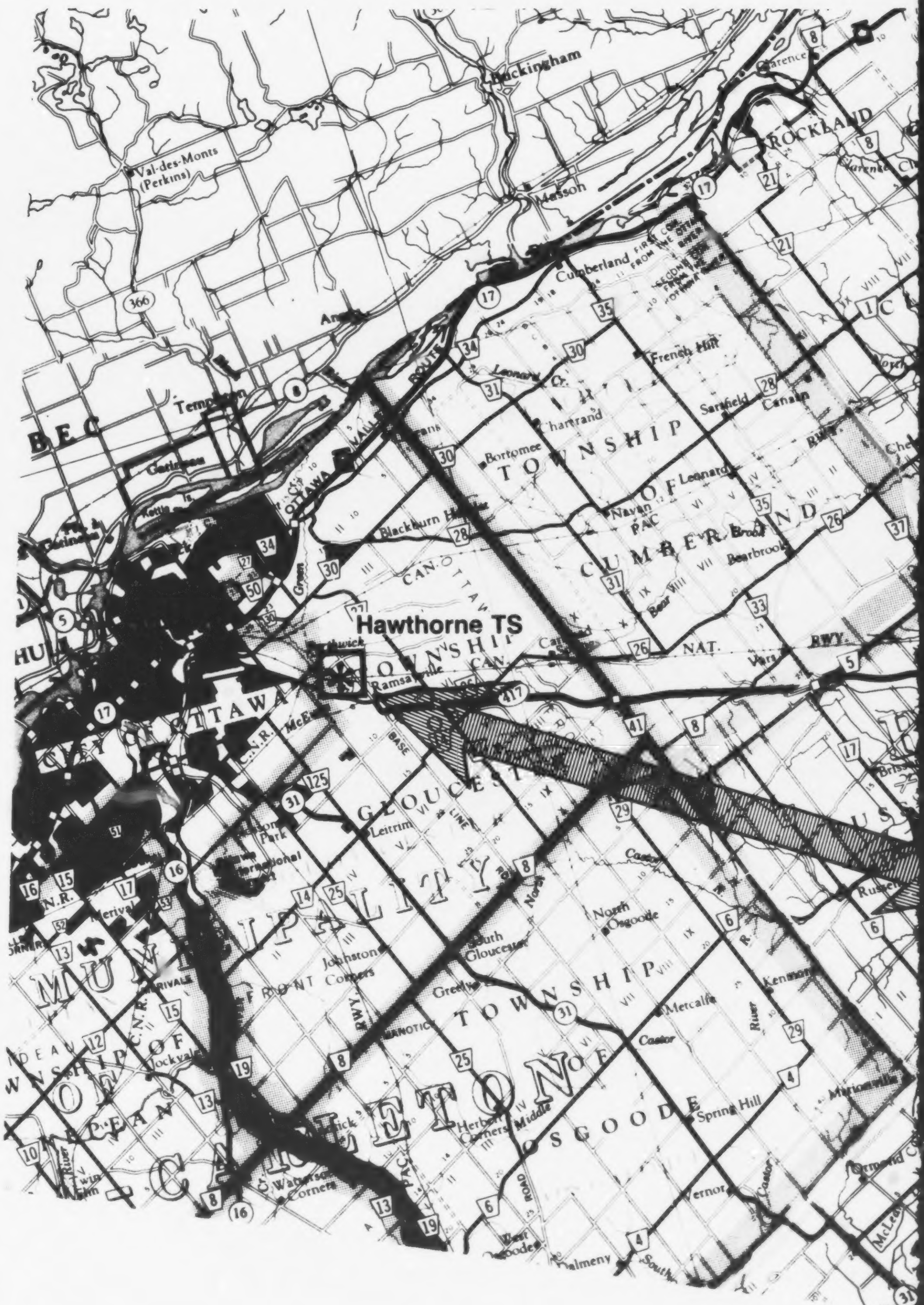
10.3 Public Review of Study Area

The study area for the microwave repeater station and the proposed terminal station location at St. Lawrence TS were reviewed with the Regional Committee on March 28, 1983 and no concerns were expressed.

On March 11, 1983, Bulletin #1, which explained the background to the study, and included a map showing the study area being considered and the location of the terminal station, was mailed to those people on the project mailing list who indicated an interest in the study.

At the MPCs, held in March and April 1983, general information on the telecommunications study was available. At the Finch, Winchester and Cornwall MPCs, more detailed information such as the constraint maps and aerial photo mosaics were also available to assist residents in commenting on the study. Ontario Hydro staff were in attendance to answer questions and assist people with maps and materials.

Very few people had comments on the study.


Hawthorne TS
Buckingham
Val-des-Monts (Perkins)
Masson
Clarence
ROCKLAND
Cumberland
French Hill
Sarsfield
Canaan
Chartrand
Bortomee
TOWNSHIP OF CUMBERLAND
Navan
Bearbrook
Blackburn Hamlet
Templeton
Gatineau
CITY OF OTTAWA
Ramsayville
GLOUCESTER TOWNSHIP
Leitrim
North Gloucester
North Osgoode
Johnstons Corners
Greely
Metcalfe
Kenmore
OSGOODE TOWNSHIP
Spring Hill
Vernon
Herbert Corners
Middle
Castor
MUNICIPALITY OF CARLETON
NEPEAN
Jockvale
Manotick
Watsons Corners
Marionville
Russell
Vars
NAT. RWY.
Osgoode
Dalmeny
South
Osgoode
17
34
31
30
28
26
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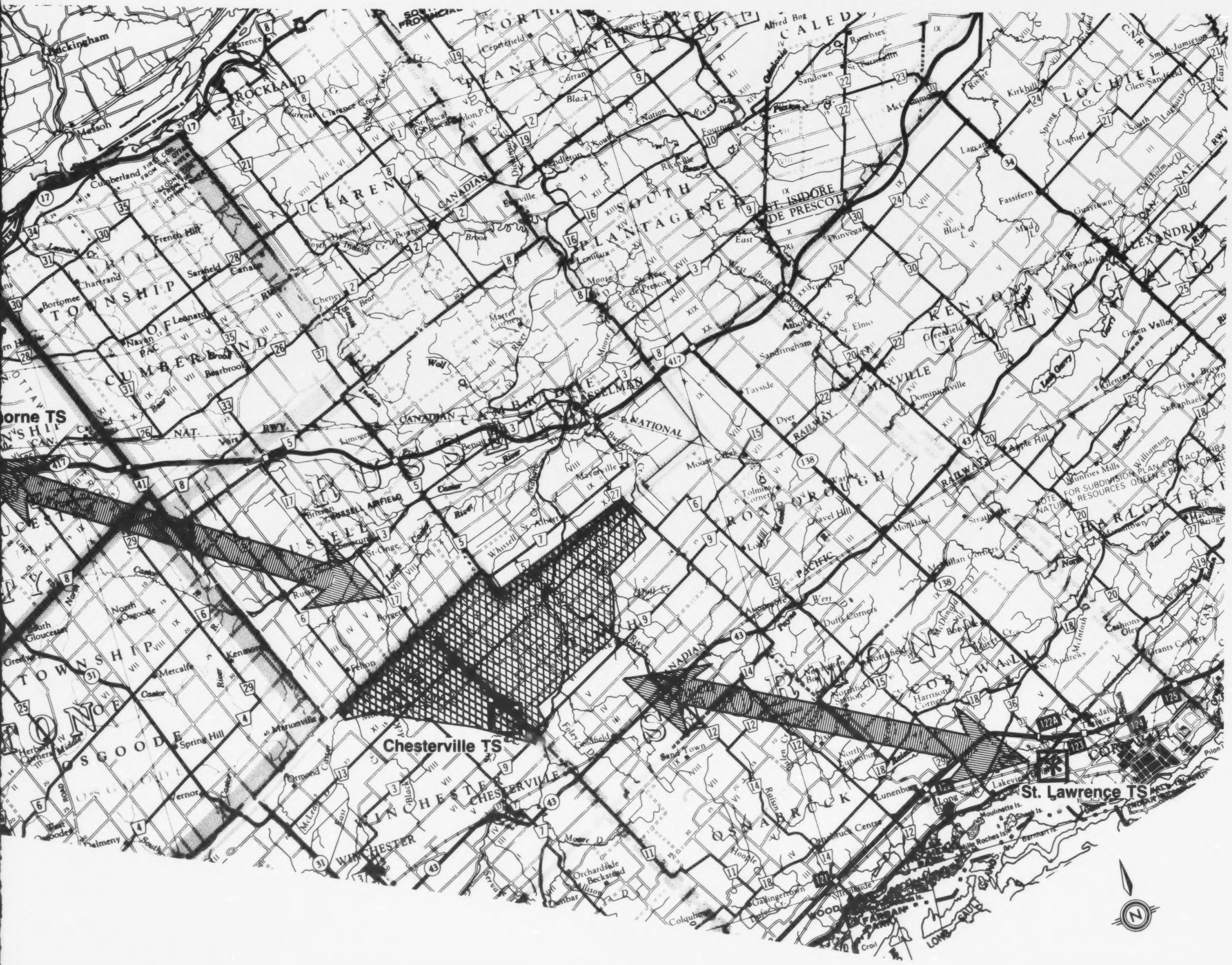
14
125
417
366



borne TS
Chesterville TS
St. Lawrence TS
Rockland
Clarence
Cumberland
Township of Cumberland
Osgoode
Russell
Cambridge
Casselman
South Plantagenet
North Plantagenet
St. Isidore de Prescott
Caledonia
Kenyon
Lochiel
Alexandria
Maxville
Roxborough
Charlottenburgh
Cornwall
Osnabruck
Winchester
Chesterville
Glengarry
Canadian National Rwy.
Canadian Pacific Railway
Long Sault
Lunenburg
Metcalfe
Spring Hill
Marionville
Vernon
Sandringham
Dominionville
Monkland
Apple Hill
Green Valley
Lancaster
Note: For subdivision plan contact Natural Resources Queen's Park Toronto
N

Figure 10.1
Study Area - Telecommunications Facilities

Legend

*	Terminal Station
☐	Transformer Station
▨	Study Area
⇔	General Direction of Signal Path

MF. Roll No.	Rev.	Date	Particulars	Drawn	App'd.

Ontario Hydro
Design and Development Division - Transmission

Drawn by K. Kolyn	Supervising Planner
Date March 1985	Supervising Project Engineer
Work Order 840-03017	Graphics Prod. Supervisor D. Henderson

Scale	Drawing No.	Rev.	Sheet
1:250,000	RS170-LUEP-RA6-0050	0	1 of 1

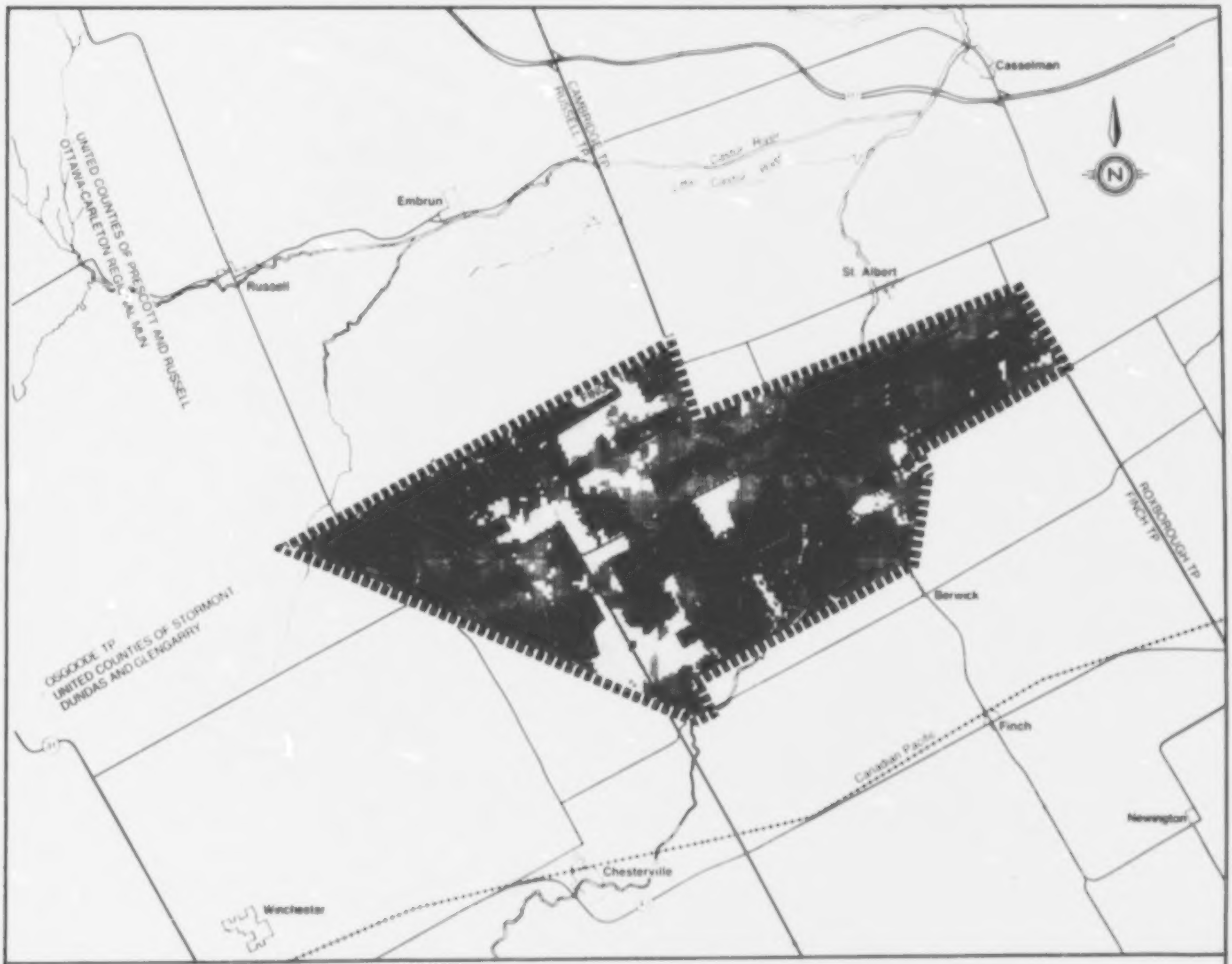

Casselman
CAMBRIDGE TP
RUSSELL TP
Castor River
Little Castor River
Embrun
UNITED COUNTIES OF PRESCOTT AND RUSSELL
OTTAWA-CARLETON REGIONAL MUN
Russell
St. Albert
ROXBOROUGH TP
FINCH TP
Berwick
OSGOODE TP
UNITED COUNTIES OF STORMONT DUNDAS AND GLENGARRY
Finch
Canadian Pacific
Newington
Chesterville
Winchester
N

Figure 10.2
Composite Environmental/Technical Constraint Map

Legend

▪▪▪▪▪▪▪▪ Study Area Boundary

☐ No Known Constraint

■ High Constraint

▨ Medium Constraint

☐ Low Constraint

0 1 2 3 4 5 Miles

1 0 1 2 3 4 5 6 Kilometres

11.0 ALTERNATIVE TELECOMMUNICATIONS SITE DEVELOPMENT

Alternative sites were identified within the study area where alternatives would be technically and environmentally suitable. No alternatives to the St. Lawrence TS site were identified for technical reasons.

11.1 Data Collection

The composite environmental/technical constraint map identified smaller areas where more detailed analysis would be carried out for identifying alternative microwave repeater station sites. These were generally the areas of medium, low and no known constraint.

11.1.1 The Environment

The types of information considered to assist in the identification of alternative sites included the following:

- existing development
- land use (includes agriculture, aggregate extraction)
- forest cover
- soils
- topography
- property ownership
- municipal planning designations

For a list of the specific data types considered and their sources, refer to Appendix D7.

11.1.2 Technical

Technical information was collected and mapped within and in the vicinity of the study area, using the same process as described in Section 5.2.3. The same technical organizations were contacted and no specific concerns were expressed.

11.2 Location of Alternative Sites

A set of site selection criteria were developed for identifying alternative sites. They were related to a variety of land use, environmental, technical and cost factors and were further divided under four categories ranging from least desirable to most acceptable situations for locating a microwave radio repeater station. These criteria are listed in Table 11.1.

The nature of the site selection criteria are such that they could be applied through the use of (a) the composite constraint maps, (b) the additional detailed data collected, and (c) the results obtained from field observations.

Through application of the site selection criteria, eight alternative sites were identified as shown in Figure 11.1. The location of the St. Lawrence TS site is shown in Figure 11.2.

11.3 Description of Alternative Sites

All of the eight alternative sites identified were situated adjacent to all weather access roads, minimizing the length of on-site access required. Furthermore, all of the sites were located on properties which were zoned Rural and contained no known conflicts with existing land uses. The following describes the alternative sites by Township:

- Wincester Township

C1 - Existing Ontario Hydro transformer station
C2 - Abandoned pasture
C3 - Pasture

- Finch Township

C4 - Abandoned pasture
C5 - Vacant
C6 - Abandoned pasture
C7 - Abandoned pasture
C8 - Vacant

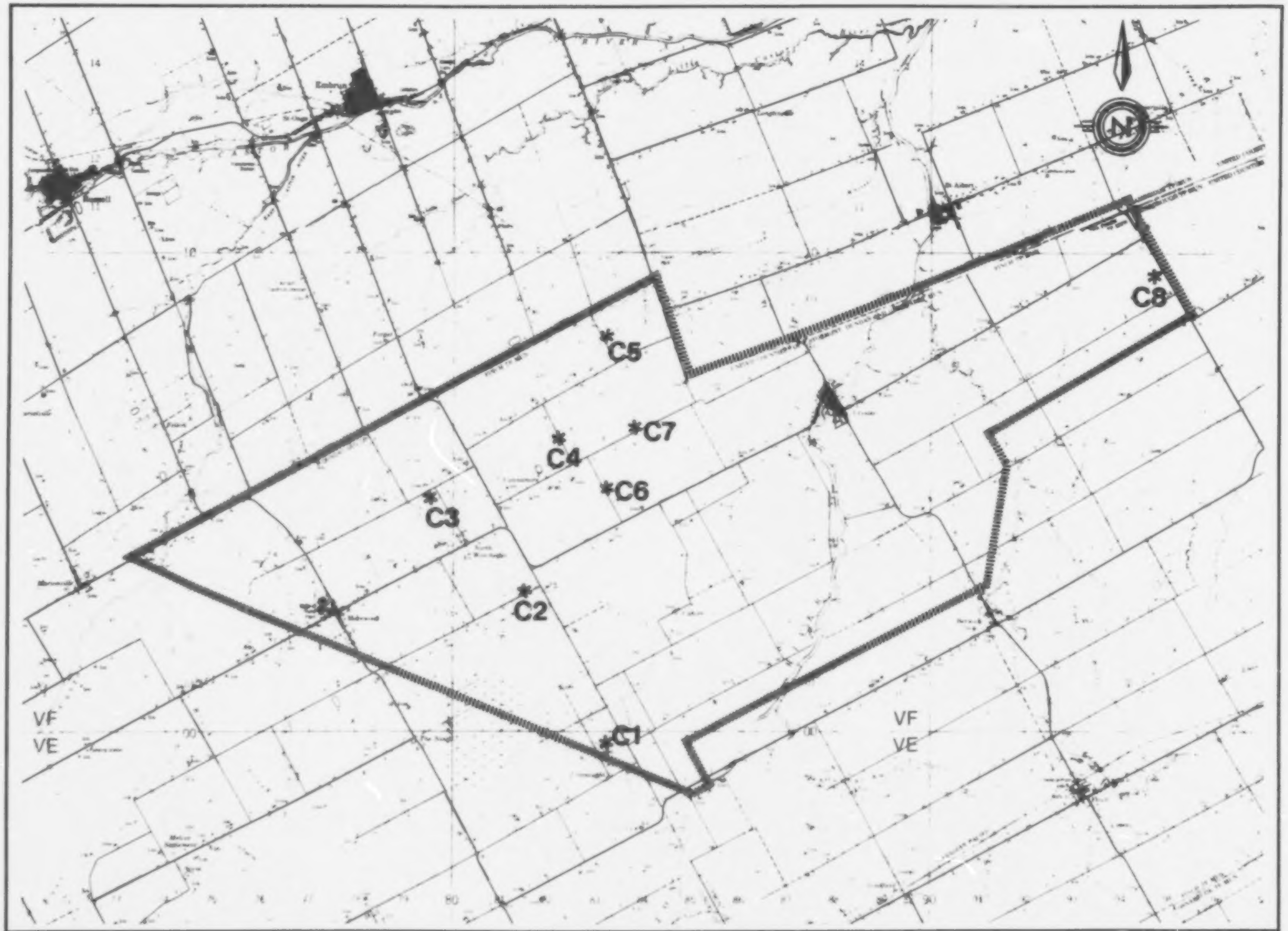

C1
C2
C3
C4
C5
C6
C7
C8
VF
VE
VF
VE

Figure 11.1
Alternative Microwave Radio Repeater Station Sites

Legend:

▨ Study Area Boundary

* Alternative Site

Miles 1 0 1
Metres 1000 0 1000

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TABLE 11.1

Site Selection and Rejection Criteria

FACTORS	LEAST DESIRABLE SITUATIONS	RESTRICTED SITUATIONS	ACCEPTABLE SITUATIONS	MOST ACCEPTABLE SITUATIONS
Environmental				
Agricultural Resources	- farm buildings			- abandoned agricultural lands
Biological Resources		- undisturbed natural environments - areas close to waterfowl habitats	- disturbed natural environments	
Forest Resources		- forested areas showing good production - forests containing merchantable timber	- low production forest land	- non-productive forest land
Mineral Resources	- lands directly adjacent to quarry operations			- abandoned pits and quarries
Human Settlement	- homes and adjacent properties - other occupied buildings	- areas in full view of homes or proposed residential subdivisions	- areas that are relatively isolated from view of homes and proposed residential subdivisions	- areas that are completely isolated from view of homes and proposed residential subdivisions

TABLE 11.1

Site Selection and Rejection Criteria

FACTORS	LEAST DESIRABLE SITUATIONS	RESTRICTED SITUATIONS	ACCEPTABLE SITUATIONS	MOST ACCEPTABLE SITUATIONS
Heritage Resources		- areas adjacent to designated heritage resource areas	- areas of archaeological potential provided that appropriate surveys and assessments are conducted and archaeologist's recommendations are adhered to	
Recreation Resources		- areas adjacent to or in full view of recreational areas	- areas that are relatively isolated from view of recreational areas	- areas that are completely isolated from view of recreational areas
Technical/Cost	- areas more than 1.6 km from an electrical power supply - wetland areas	- areas of relatively lower elevation		- Ontario Hydro owned property - areas of relatively higher elevation - areas within 0.4 km of a year round access road with an electrical power supply

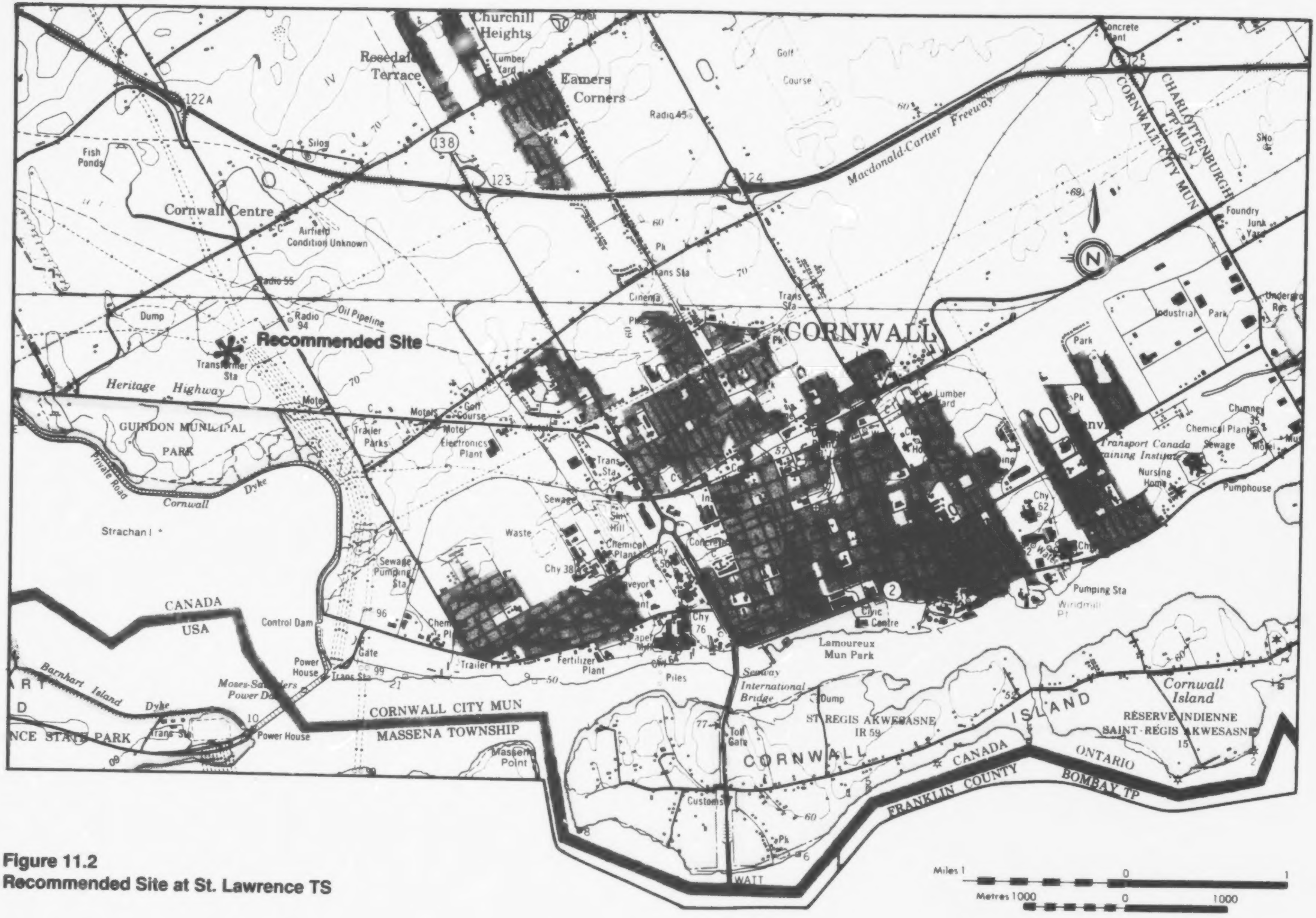
Recommended Site
Transformer Sta
CORNWALL
Cornwall Centre
Churchill Heights
Rosedale Terrace
Eamers Corners
Macdonald-Cartier Freeway
Heritage Highway
GUINDON MUNICIPAL PARK
Cornwall Dyke
Strachan I
Control Dam
Power House
Moses-Saunders Power Dam
Barnhart Island
CANADA
USA
CORNWALL CITY MUN
MASSENA TOWNSHIP
CHARLOTTENBURGH TP MUN
CORNWALL CITY MUN
Seaway International Bridge
Lamoureux Mun Park
Civic Centre
Cornwall Island
RÉSERVE INDIENNE SAINT-RÉGIS AKWESASNE
ST REGIS AKWESASNE IR 59
CORNWALL ISLAND
ONTARIO
FRANKLIN COUNTY
BOMBAY TP
Industrial Park
Transport Canada Training Institute
Airfield Condition Unknown
Oil Pipeline
Dump
Fish Ponds
Silos
Radio 94
Radio 55
Radio 45
Golf Course
Trailer Parks
Electronics Plant
Waste
Sewage
Chemical Plant
Fertilizer Plant
Paper Mill
Pumping Sta
Windmill Pt
Pumphouse
Nursing Home
Foundry
Junk Yard
Concrete Plant
Customs
Toll Gate
Piles
Massena Point
122A
123
124
125
138
N
Miles 1
0
1
Metres 1000
0
1000

Figure 11.2
Recommended Site at St. Lawrence TS

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12.0 EVALUATION AND COMPARISON OF ALTERNATIVE SITES

Each alternative site was examined in more detail from land use, environmental, technical and economic perspectives.

The location of the sites was referenced to lot and concession. Land use of the site including official plan designations and zoning was investigated. Adjacent land uses were also observed and documented. Natural environment considerations included descriptions of vegetation, soils, slope and drainage. A visual impact component was also included which took into account tower height and tower visibility from nearby human settlement concentrations and rural residences.

The technical and economic considerations dealt with site conditions for construction, approximate construction costs, accessibility, proximity to commercial power supply and other technical concerns.

A similar but less detailed evaluation was conducted for the St. Lawrence TS site.

The environmental, technical and cost information for the alternative sites and the St. Lawrence TS site is provided in Tables 12.1 and 12.2 respectively.

As a result of the evaluation phase, the following provides a comparison of the alternative sites:

- All of the sites would require some minor clearing of trees and shrubs except for sites C1 and C3.

- Site C1 has an existing access road. All of the other sites would require short access roads except C3, which would require a much longer access road to avoid active agricultural land.

- None of the sites have physical limitations for access.

- Drainage is generally good for all sites except site C2 which has poor drainage.

- All sites have adjacent power supplies except for sites C4, C6 and C8; these sites require the extension of a power distribution line for a length of up to 1 km.

- All sites would be visible from long distances, however, site C1 has the least number of residences with no towns or villages within a 5 km radius.

- All of the sites would require the purchase of private property except for site C1 which is located adjacent to the Chesterville TS on Ontario Hydro property.

Table 12.1 Alternative Site Evaluation

DESCRIPTION	C1	C2	C3	C4	C5	C6	C7	C8
A. Site Location	- Lot 24, Conc. 7 Winchester Twp	- Lot 24, Conc. 9 Winchester Twp	- Lot 23, Conc. 11 Winchester Twp	- Lot 3, Conc. 11 Finch Twp	- Lot 7, Conc. 12 Finch Twp	- Lot 4, Conc. 10 Finch Twp	- Lot 6, Conc. 11 Finch Twp	- Lot 24, Conc. 9 Finch Twp
B. Land Use								
- ON-SITE	- TRANSFORMER STATION	- ABANDONED PASTURE	- AGRICULTURE	- ABANDONED PASTURE	- VACANT	- ABANDONED PASTURE	- ABANDONED PASTURE	- VACANT
- IN PROXIMITY TO SITE	- AGRICULTURE	- PINE PLANTATION AND AGRICULTURE	- AGRICULTURE	- ABANDONED AGRICULTURE	- AGRICULTURE - QUARRY	- AGRICULTURE	- AGRICULTURE	- AGRICULTURE
- Official Plan Designation	- Rural	- Hazard Land - SUITABLE CONSERVATION	- Rural	- MARGINAL LANDS	- MINERAL AGGREGATE	- AGRICULTURE	- Marginal Lands	- Marginal Lands
- Zoning	- Rural	- Rural	- Rural	- Rural	- Rural	- Rural	- Rural	- Rural
C. Natural Environment Considerations								
- VEGETATION	- GRASS AND SPARSELY SCATTERED YOUNG DECIDUOUS TREES	- SHRUBS, YOUNG CEDAR AND DECIDUOUS TREES	- HAY AND PASTURE DIVIDED BY HEDGE ROWS	- GRASS, SHRUBS AND SEMI-MATURE DECIDUOUS TREES	- GRASS, SHRUBS AND SEMI-MATURE CONIFEROUS AND DECIDUOUS TREES	- GRASS, SHRUBS AND YOUNG DECIDUOUS TREES	- GRASS, SHRUBS AND YOUNG DECIDUOUS TREES	- GRASS AND SEMI-MATURE CONIFEROUS AND DECIDUOUS TREES
- SOILS	- LOAM	- CLAY LOAM	- SANDY LOAM	- SHALLOW LOAM	- LOAM	- LOAM	- LOAM	- SHALLOW LOAM
- SLOPE	- UNDULATING	- SLIGHTLY UNDULATING	- ROLLING	- UNDULATING	- GENTLY UNDULATING	- UNDULATING	- UNDULATING	- ROLLING
- DRAINAGE	- GOOD DRAINAGE	- POOR DRAINAGE	- GOOD DRAINAGE	- GOOD DRAINAGE	- IMPERFECT DRAINAGE	- GOOD DRAINAGE	- GOOD DRAINAGE	- GOOD DRAINAGE
D. Visual Considerations								
- APPROXIMATE TOWER HEIGHT (M)	- 85	- 94	- 91	- 96	- 96	- 96	- 96	- 108
- TOWER VISIBILITY (WITHIN 5 KM)	- 172 RESIDENCES	- 197 RESIDENCES AND Moorewood	- 233 RESIDENCES AND Moorewood	- 227 RESIDENCES	- 244 RESIDENCES AND WEST HALF OF Crysler	- 214 RESIDENCES AND WEST HALF OF Crysler	- 214 RESIDENCES AND Crysler	- 189 RESIDENCES AND St. Albert
E. Technical/ Economic Considerations								
- SITE CONDITIONS	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD	- GOOD
- APPROXIMATE CONSTRUCTION COST ($1000's)*	- BASE	+ 30	+ 10	+ 40	+ 40	+ 40	+ 40	+ 100
- ROAD ACCESS - TO SITE - ON SITE	 - EXCELLENT - EXCELLENT	 - GOOD - GOOD	 - GOOD - LONGER ACCESS REQUIRED	 - GOOD - GOOD	 - GOOD - GOOD	 - GOOD - GOOD	 - GOOD - GOOD	 - GOOD - GOOD
- POWER SUPPLY	- ON SITE	- ADJACENT TO SITE	- ADJACENT TO SITE	- NO POWER FOR 0.5 KM	- ADJACENT TO SITE	- NO POWER FOR 0.5 KM	- ADJACENT TO SITE	- NO POWER WITHIN 1 KM

* As compared to base.

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Table 12.2
Recommended Site at St. Lawrence Transformer Station

Description	St. Lawrence TS
A. Site Location	• On Power Dam Drive north of Highyway #2 City of Cornwall
B. Land Use	
• Existing	• Transformer Station
• Ownership	• Ontario Hydro
• In proximity to site	• Municipal dump, radio towers, transmission lines, scattered residences & farms.
• Official Plan designation	• Major Public Open Space
• Zoning	• Agricultural
C. Visual Considerations	
• Approx. tower height	• 93 metres
• Tower visibility	• Visible from surrounding area Few residences in vicinity Visual effect reduced as transmission towers, transformer station and 2 radio towers already present.

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13.0 SELECTION OF RECOMMENDED TELECOMMUNICATIONS SITES

13.1 Selection Rationale

After the initial evaluation and comparison of the alternatives, one site clearly stood out as having the most advantages and least disadvantages. The advantages of this site were strong enough that alternatives to this site were not considered further. Site C1 at Chesterville TS was selected for the following reasons:

- located on Ontario Hydro property;
- least cost;
- power supply on site;
- excellent site conditions;
- no removal of trees or shrubs required; and
- relatively lower potential visual effect due to the lowest number of residences and the absence of towns and villages within a 5 km radius.

No alternatives were considered to the site at St. Lawrence TS because the facilities are technically required at this location. This site has the advantage of being in an industrial area with few residences in the immediate vicinity.

13.2 Summary of Potential Effects and Mitigation

Any environmental effects resulting from construction are expected to be minor and would be addressed through use of the 'Construction and Site Restoration Guidelines for Transmission Facilities, March 1981', as approved by the Minister of the Environment.

Reduction of visual effects associated with the presence of these structures was dealt with during the site identification process. The extent of tower visibility could be minimized in specific locations but generally could not be reduced further due to the height of these facilities.

13.3 Public Response

At this step in the study, all those properties within approximately a 120 m radius of each of the two recommended sites were identified from Ministry of Revenue assessment maps. The appropriate roll numbers were noted and the names and addresses obtained from the Ministry of Revenue and added to the study mailing list of interested individuals and organizations.

On August 22, 1984 the study Bulletin was mailed to all those on the mailing list. It explained the study status and contained a map showing the location of the two sites and a description of a microwave radio station. A schedule of the upcoming municipal participation centres was provided and residents were encouraged to attend and/or use the information line provided in the Bulletin if they had any questions. Advertisements promoting the centres were placed in local newspapers.

At all of the MPCs, held in September 1984, general information on the telecommunications study was available. At the Cornwall Township/City of Cornwall MPC and the Finch/Winchester/Osnabruck MPC, more detailed information was available on the St. Lawrence TS and Chesterville TS sites respectively.

Very few comments were received from residents either about the telecommunications study in general or the two sites in particular. No objections were recorded.

14.0 Telecommunications Site Finalization

14.1 Public Information Programme

After the locations of the sites have been approved, meetings with neighbours of the approved sites could be scheduled as required to explain the construction procedures and to answer questions.

14.2 Final Design

The communications system design would be done and a specification, stipulating detailed system performance, equipment, material and labour requirements, would be prepared and would become part of the tendering document.

After award of a contract, the prime contractor would be responsible for conducting a path survey to verify path profiles and tower heights to ensure the system reliability is met. This would encompass such activities as field surveys, site tests, aerial surveys, etc, at the selected sites and high elevation points along the signal route. No construction work would commence until all field surveys have been completed.

14.3 Property Acquisition

Acquisition of property is not required as both sites are located on Ontario Hydro property.

14.4 Construction

Initially, the area would be graded, appropriate drainage facilities installed and foundation work completed. Tower foundations would usually require excavation at the site and would be constructed of reinforced concrete. The tower would be assembled on the ground in sections and raised by a crane. During construction, temporary fencing would be erected in order to meet specific municipal or county requirements. Upon completion of the construction, and prior to placing the equipment in service, the area outside the station could be landscaped. All excess material, debris, rubbish and temporary structures, etc, would be removed from the site.

The microwave radio towers would be self-supporting and conform with CSA Standard S37-1965. Upon completion of the construction of each tower, the contractor would be required to provide an affidavit, certifying that the tower has been inspected and conforms to CSA Standards.

14.5 Operation and Maintenance

The operation of a microwave radio repeater station is automatic; that is, it is unattended. Routine maintenance would consist of an annual check of operating voltages and signal levels. Emergency maintenance would be performed upon receipt of equipment failure alarms at the Richview Microwave Radio Alarm Centre.

APPENDIX A

GLOSSARY OF TERMS

Alternating Current (AC) - current that reverses its direction of flow at regularly recurring intervals of time.

Alternative Methods of - the various generic ways of handling the preferred alternative that receive detailed consideration and may involve minor differences but still achieve the objective in basically the same manner, example: alternative location, alternative tower types, alternative construction techniques.

Alternative To - a structural or non-structural activity that meets the objectives or purpose of the proponent but does so in a significantly different manner than those types of activities from which the undertaking is ultimately selected.

Ampere (amp) - a unit of measurement for the flow of electrical current.

Autotransformer - a power transformer with a single main winding per phase with both primary and secondary connections made to the single winding.

Band - a linear, irregularly shaped geographic area, of a defined minimum width, within which the probability of finding acceptable locations for transmission facilities seems greatest in light of the constraints identified during the Plan Stage Study.

Base Load - the minimum continuous amount power required over a long period of time (minimum of one month).

Bulk Power Electricity System - the transmission, switching, transformation and other terminal station facilities which connect the principal sources of power generation and the major load centres. At present voltage levels of 500 kV and 230 kV are used in Ontario Hydro's bulk power transmission network.

Bus - heavy conductors in a transformer station to which components such as transformers or transmission circuits are connected, by means of circuit breakers or switches.

Cable TV Headend - the portion of a cable TV system where the radio and television signals are received and processed before distribution to individual subscribers. At the cable TV headend, the signals may be received via off-air broadcast stations, microwave radios, satellite earth stations, and/or generated locally via video/audio recorders.

Capacitance - the property of a system of conductors and dielectrics that permits the storage of electrical charges.

Capacitor - a static device used to improve the power factor of the power system or to improve power system voltages.

Centreline - a line drawn on maps (orthophotos) that represents the centre of the final right of way and the location of the transmission line itself.

Circuit - a set of conductors, insulated from each other, three for a three phase system, two for a single phase system, through which electric current is intended to flow.

Circuit Breaker - a heavy duty switch which is used to switch power system components in or out of service and which is capable of being automatically opened to separate components from the system.

Cogeneration - the utilization of waste heat from an industrial process to produce electricity.

Combined Cycle Plant - a plant that uses waste heat from large gas turbines (driven by gases from the combustion of hydrocarbon fuels) to generate steam for conventional steam turbines. Both the gas and the turbines could be used to produce electricity.

Comparison - the part of the land use and environmental planning process in which the advantages and disadvantages among alternatives are systematically assessed.

Conductor - a wire or combination of wires not insulated from one another, designed to carry electric current. It may be bare or insulated.

Constraint Map - a map which displays the geographic distribution of areas of differing limitations to the location of transmission facilities; determined as the relative sensitivity of land use and environmental resources to change as a result of transmission line development.

Corona - a luminous electric discharge resulting from the breakdown of the insulating properties of the air surrounding a conductor.

Corridor - a linear, geographic area of approximately 1,500 m in width, within which the probability of finding acceptable locations for transmission facilities seems greatest in light of the constraints identified during the Route Stage Study.

Counterpoise - a conductor or system of conductors arranged beneath a transmission line which are located above, on, or more frequently below the surface of the earth and connected to the footings of the tower or poles supporting the line. The purpose of these ground wires is to lower the ground resistance and thereby reduce system outages as a result of lightning strikes or switching surges.

Cycle - one complete set of positive and negative values of alternating current. A cycle usually consists of one positive pulse followed by one negative pulse. (See frequency.)

Direct Current (DC) - current which, under normal conditions, continues to flow in one direction only.

Direct Effect - the immediate and measurable physical alterations to the environment caused by construction and operation of transmission facilities.

Distributing Station (DS) - a group of electrical components which receive electrical power at one voltage (115 kV or less) and which transform those voltages to a lower voltage suitable for distributing the power to local customers.

Distribution Line - the facilities, overhead or underground, at voltages as high as 44 kV for transporting small amounts of power from a distributing station or a regional supply centre to the customers' local transformer.

Electric Energy - the energy associated with the product of voltage and current over an interval of time. Energy is measured in kilowatt-hours.

Electric Field - a state existing in a medium between two bodies at two different electrical potentials. If an electric charge were placed there, it would have a force exerted on it tending to make it move.

Energy - the ability of a system of components to do work. It is equal to the average power that the system can sustain over an interval multiplied by the time duration of the interval.

Energy Demand - the average power required to meet the load over a stated interval of time.

Energy Load - energy measured at the point of delivery.

Environment - as defined in The Environmental Assessment Act, 1975, means:

(i) air, land, water

(ii) plant and animal life, including man

(iii) the social, economic and cultural conditions that influence the life of man or a community

(iv) any building, structure, machine or other device or thing made by man

(v) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities of man, or

(vi) any part or combination of the foregoing and the inter-relationships between any two or more of them.

Environmental Effect - a change in the present or future environment expected to be brought about either directly or indirectly as the result of the implementation of a proposal.

Evaluation - the part of the land use and environmental planning process in which the advantages and disadvantages for an alternative are systematically identified.

Fabric of the Land - the geographic orientation and/or political survey of the lot, concession, and township pattern.

Factor - a general component of the environment which is represented by a group of related objectives (i.e., Agricultural Resources, Biological Resources).

Factor Map - a map which displays the geographic distribution of the situations representing one factor.

Fault - failure of insulation on a power system component which results in extremely high current flow and very low voltage. The component must be disconnected immediately to minimize the effects of the fault on the power system and the component itself.

Fault Current - an electric current that flows from one conductor to ground or to another conductor owing to an unintentional electrical connection (including an arc) between the two.

Firm Demand - this is the electrical energy which must be supplied to purchasers on a continuous basis.

Firm Power - power available for use by the purchaser on a continuous basis.

Flashover - an electrical arc from one electrically charged object to another.

Frequency - the number of cycles of alternating current which occur in one second. Electric power frequency in North America is usually 60 cycles per second. A hertz is one cycle per second.

Gas Insulated Switchgear - an assembly of circuit breakers, switches and buses electrically insulated by pressurized gas (usually sulphur hexafluoride) enclosed by a metallic casing.

Generation - the electrical energy output by a generator.

Generator - a device which, when driven mechanically, produces electrical power.

Hydroelectric - development of electricity from falling water.

Impedance - the characteristic of electrical conductors which opposes the flow of alternating current. The net effect of the resistance and reactance.

Indirect Effect - secondary or induced effects which may occur on or off the right of way, resulting from the construction, presence, and operation of transmission facilities.

Inductance - the property of an electrical circuit whereby an alternating current induces a magnetic field. This magnetic field may induce a voltage in that circuit or a neighbouring circuit.

Integrated Power Systems - a system in which all power sources and all loads are physically interconnected in such a way that power can flow from any source to any load.

Interconnection - a transmission line which can carry power across the boundaries of service areas of adjacent electric utilities.

Interruption - the failure to supply power to a load.

Interruptible Loads - loads which under contract provisions may be interrupted within specified times and limits. In exchange for this agreement power is sold to the customer at a discount from the firm power rate.

In-service Date - the date a facility is declared available for commercial operation.

Joint Board - a tribunal composed of two members of the Ontario Municipal Board and one from the Ontario Environmental Assessment Board, established under the Consolidated Hearings Act (1981), to decide on matters pertaining to the eastern Ontario transmission study.

Kilo - as in kilometre (km), kilovolt (kV), the prefix kilo indicates the quantity or magnitude in thousands.

Link - the smallest geographic component in the network of route alternative which connects two interior terminal points.

Load - the amount of power or energy used by customers. It is measured in watts or megawatts.

Load Rejection - automatically interrupts selected customers without warning in order to prevent major system emergencies from causing widespread loss of power supply to all customers.

Losses - the power dissipated by the system itself because of the inherent resistance of transmission lines, transformers, etc. In other words, it is necessary to put more power than is needed into the system to ensure that the amount needed is available.

Magnetic Field - a state produced in a medium, either by current flow in a conductor or by a permanent magnet. It can induce voltage in a second conductor in the medium when the state changes or when the second conductor moves in prescribed ways relative to the medium or the first conductor.

Map Accuracy - a measure of the degree to which an area or feature is positioned and classified accurately.

Mega - as in Megawatt, the prefix mega indicates the quantity or magnitude in units of a million.

Mitigation - includes the prevention, modification, or alleviation of environmental effects caused by the implementation of a project.

Municipal Participation Centre (MPC) - an open house, or information centre, held in co-operation with local municipalities affected by the study, to which property owners and interested public were invited to attend, provide local knowledge, and comment on the study.

Objective Statement - a statement consisting of: (1) a directive to avoid a particular type of land use and environmental characteristic when locating transmission facilities; (2) a description of the importance of the resource; (3) a description of the magnitude of the possible effects if encountered; and (4) a description of the possible mitigation measures which could be applied to minimize the effects.

Operating Reserve - that spare generating capacity capable of producing energy within a short period of time - that is less than 30 minutes.

Outage - a temporary disconnection of a part of a system as the result of either a fault or scheduled maintenance. An outage may not necessarily result in an interruption in the supply of power.

Peak Load - the highest average load during a time interval of specified duration, for example, 20 minutes, occurring during a given period of time, such as one day.

Power - the rate of doing work, or, in an electrical network, the rate at which electrical energy is being supplied.

Power Transfer - a term used to describe the transportation of electrical power via conductors connecting two or more terminal stations or areas.

Present Worth - the equivalent value at a time designated as the 'present' of a particular future payment or receipt, or of all future payments and receipts associated with a given course of action, taking into account the time-related value of resources.

Rating - a technique used to assign a relative numerical value to the identified objectives, based on the description presented in the objective statements.

Reactance - that characteristic of an alternating current system that combines with resistance to form impedance. Reactance is associated with the energy stored in the magnetic field of an electrical circuit.

Re-conductoring - refers to work associated with replacing existing transmission line conductors, usually with those of a larger size.

Regional Committee - an advisory committee composed of representatives from government ministries, departments and agencies, municipalities, public interest groups and other interested individuals, who helped establish priorities for the level of importance of the objective 'resource value' and the relative environmental 'constraint'.

Resistance - the characteristics of electrical conductors which opposes the flow of that part of the electrical current which is in phase with the voltage. It causes a voltage drop and power loss in the circuit.

Re-tensioning - refers to work associated with increasing the tension of overhead transmission line conductors. This would increase the distance between the ground and conductors, thereby permitting some increase in the amount of the power that could be transmitted.

Right of Way - the actual area required by Ontario Hydro to construct and operate the facilities for which approval is being requested.

Rip-rap - broken rock, cobbles or boulders placed on surfaces, such as the face of a dam or the bank of a stream, for protection against the action of water.

Route - a linear, geographic area which represents the approximate right of way for the proposed transmission facilities.

Security - the inherent capability of a power system to continuously supply electricity. This is accomplished through the planning of alternative sources or alternate lines of supply for customer loads. Security can also be affected by tower design and line specifications. A secure system is one which continues to function when sudden stresses, such as the loss of a component, occur within the system.

Shunt Capacitor - a static (no rotating parts) electrical device used to maintain adequate voltage in a power system.

Situation - an identified land use and environmental characteristic which is expected to be affected by transmission facilities and is displayed by combining specific data contained within the inventory.

Skylining - a situation that occurs when a transmission tower(s) is silhouetted against the sky as a result of being located on a high point of land. The viewer is generally at a lower elevation looking up through the tower.

Skywire - grounded wire placed above conductors of a transmission line of intercepting lightning strikes to protect the phase conductors.

Switching Station (SS) - a point in the power system where transmission lines are interconnected through circuit breakers.

Synchronous Condensor - a rotating machine for ensuring adequate system voltage.

Thermal-Electric Generating Station - a generating station which uses steam to rotate a turbine, which in turn drives an electric generator. The conventional fuels used to create heat for the production of steam are bituminous coal, lignite coal, oil, or natural gas. Nuclear reactors are also used as a heat source.

Trade Offs - benefits and disbenefits associated with one option which are compared to the benefits and disbenefits of another option, thereby arriving at the most acceptable choice between them.

Transformer Station (TS) - group of electrical components or elements arranged to transfer power from one voltage level to another; to terminate transmission circuits at the various voltage levels; and to provide for an interchange or redistribution of power among the circuits at each voltage level.

Transmission Line - the conductors and their supporting towers, used to convey electric energy from one point to another.

Viewshed - the area(s) which can be seen from a given location or the area(s) from which a specific feature is visible. The size of the viewshed is dependent upon the interaction of: the height of the viewpoint or feature relative to the surrounding terrain; the amount, type and height of surrounding vegetation; the presence of clearings or openings, such as lakes or fields; the presence of concentrations of buildings; and the relative distances between the viewer, obstructions and the feature.

Volt - a unit of electrical pressure which tends to cause the flow of electrical current.

Watt - unit of electrical power; represents the power used when one ampere flows through circuit with a pressure of one volt.

APPENDIX B

LAND USE, ENVIRONMENTAL AND SOCIAL/ECONOMIC PLANNING INFORMATION

Appendix B1

Data Types, Sources and Contacts

This appendix contains a listing of 54 land use and environmental data types used in the preparation of environmental situations and objective statements in the Eastern Ontario Route Study - East Section.

The information has been stored in a computer in the following manner:

From the base information maps of 1:50,000 NTS maps, the data were copied by tracing the shapes with an electronic cursor, a process called digitizing, and stored on a PDP 11/70 mini-computer. The data stored on the computer are referenced to the 6° Universal Transverse Mercator Grid System and recorded as they are represented on the base maps as areas and lines. The data may be output as maps, at any desired scale, using a 91 cm electrostatic plotter for data presentation.

Computer output was checked with the original source to ensure that all pertinent data had been transferred and located correctly. The data were also checked by means of field visits and/or aerial photographic interpretation.

The data was then converted to a 500 metre by 500 metre grid cell format. This standard cell format allowed for efficient modelling and development of factor and constraint maps.

Capitalized alpha-numeric symbols located to the right of the map titles and data descriptions refer to the computer codes used to input and store data.

Individuals noted as personal contacts who are listed with an asterisk(*) are no longer with the organization mentioned.

B1.1 AGRICULTURAL RESOURCES

Data Types

(1) Agricultural Land Use Systems (ERALU)

- monoculture - MONOC
- corn system - CORN
- mixed system - MIXED
- hay system - HAY
- pasture system - PASTR
- grazing system - GRAZE
- specialty agriculture - SPAGR
- sod farms - SODFM

(2) Tile Drainage (ERDRA)

- tile drainage - DRAIN

(3) Soil Capability for Agriculture (Field Crops) (ERSCP)

- C.L.I. soil capability classes 1 to 7
- organic soils - O

Data Sources and Contacts

Published and Unpublished Data

- Forestry Agricultural Resources Inventory of Eastern Ontario (FARINEO), 1982, prepared by the Foodland Development Branch, OMAF, 87 p. + computer data.

- Interpretation of 1979 Aerial Photographs, (1:30,000).

- Agricultural Land Use Systems of The Regional Municipality of Ottawa-Carleton Map, 1979, Soil Research Institute, Agriculture Canada, (1:30,000).

- Soil Capability for Agriculture Map, 1969, Canada Land Inventory, (1:50,000).

- Field Reconnaissance.

Personal Contacts

- Ministry of Agriculture and Food

  Queen's Park (Toronto)

  Nick Roller - Economics Branch

County Agricultural Representatives

Ottawa-Carleton - Don Black and Terry Stuart
Stormont - Dale Miller
Dundas - Bob Humphries
Russell - Gus Beauchesne and Bruno Goucy
Prescott - Gerard Benoit

County Agricultural Engineers (Tile Drainage)

Ottawa-Carleton - Patrick S. Plue

Foodland Development Branch (Toronto)

Dave Turner* - FARINEO data
Paul Radigan* - Drainage Coordinator
Ralph Davidson - Drainage Coordinator

- Agriculture Canada (Ottawa)

Ted Huffman - Soil Research Institute

- Ontario Federation of Agriculture

- Property Owners

B1.2 APPEARANCE OF THE LANDSCAPE

Data Types

(1) Viewsheds of Provincial Highways (ERVHY)

Primary and secondary viewsheds were mapped for the following highways: 2, 31, 34, 43, 138, 401 and 417. Overlapping viewsheds were identified in a manner which allowed the viewsheds of either or both highways to be recalled.

(2) Viewsheds of Human Settlements (ERVHS)

- primary viewsheds of urban and rural residential concentrations - VURCP
- secondary viewsheds of urban and rural residential concentrations - VURCS

(3) Landscape Unit Number (ERANR)

- geographic units (over 200 values)

Derived Maps

(4) Landscape Unit Relative Relief - 0 to 300 feet (ERARC)

- relief units (29 values)

(5) Landscape Unit Crest Length (ERACL)

- long to short

(6) Landscape Unit Crest Pattern (ERACP)

- linear to random

(7) Landscape Unit Crest Orientation (ERACT)

- compass directions

(8) Landscape Unit Forest Density (ERAFD)

- percent coverage

(9) Landscape Unit Forest Pattern (ERAFP)

- hedgerows - HROWS
- no forest pattern - NONE
- scattered trees - SCATR
- bush - BUSH
- bush and woodlots -BUXWO
- woodlots - LOTS
- hedgerows and woodlots - LOTSH
- natural and hedgerows - NATRH
- natural - NATUR

(10) Landscape Unit Man-Modification (ERAMM)

- classes 1-9

(11) Landscape Unit Morphology (ERAMY)

- flat to hilly

Data Sources and Contacts

Published and Unpublished Data

- Interpretation of 1979 Aerial Photographs, (1:30,000).
- Field Reconnaissance.
- Topographic Map Series, (1:50,000).
- National Capital Commission, Mer Bleue Conservation Area Development Plan, March 1982, 60 pages.

B1.3 BIOLOGICAL RESOURCES

Data Types

(1) Wildlife Communities (ERWC)

- deer habitat - DEER

- heronry - HERON
- rare/unusual fauna - FAUNA
- moose concentration area - MOOSE
- deer habitat and moose concentration area - DRXMO

(2) Waterfowl Communities (ERFWL)

- waterfowl staging areas - STAGE

(3) Fish Communities (ERFC)

- warm water lakes, rivers, streams - WARM
- spawning areas - SPAWN
- stocked trout lakes, rivers, streams - STOCK
- natural cold water fishery which is also stocked - CDXST
- warm water fishery with spawning - WMXSP

(4) Terrestrial Communities (ERTER)

- rare/unusual flora - FLORA
- significant/representative vegetation - VEGE

(5) Biological Management Areas (ERBMA)

- designated environmental protection areas - DEPA
- nature reserves - NATUR
- scientific research area - RESCH

(6) Wetlands (ERWET)

- biologically sensitive wetlands - WETHI
- wetlands with no identified biological information - WETLD

Data Sources and Contacts

Published and Unpublished Data

- Conservation Lands in Ottawa-Carleton, Background Reports 1-5, 1976, prepared by the Planning Department, RMOC.

- Conservation Lands in Ottawa-Carleton, River Corridors and Conservation Areas Project, 1977, prepared by the Planning Department, RMOC, 74 p. + technical appendix.

- Conservation Lands in Ottawa-Carleton, Briefs and Letters and Record of Public Hearings, Vol. 1-8, 1978, prepared by the Planning Department, RMOC.

- Reed, R., 1975, An Ecological Study of Conservation - Recreation Areas in the Regional Muncipality of Ottawa-Carleton (unpublished), Department of Biology, University of Ottawa, 160 p.

- Reed, R., 1976, Ecological Studies of Conservation - Recreation Areas in the Regional Municipality of Ottawa-Carleton (unpublished), Department of Biology, University of Ottawa, 91 p.

- National Capital Commission, Mer Bleue Conservation Area Development Plan, March 1982, 60 pages.

- MNR District Sensitive Area Reports.

- MNR Eastern Region, Earth and Life Science Sites Map (1:250,000).

- Cornwall District Land Use Strategy, Draft Strategy, 1982, prepared by the Cornwall District, MNR, 61 p.

- Wetlands Map, 1975, prepared by Ontario Hydro, (1:250,000).

- Carleton Place District Land Use Strategy, Draft Strategy, 1982, prepared by the Carleton Place District, MNR, 67 p.

- An Evaluation System for Wetlands of Ontario South of the Precambian Shield, March 1984, prepared by the Ministry of Natural Resources and Canadian Wildlife Service (Ontario Region).

- Topographic Map Series, (1:50,000).

- Interpretation of 1979 Aerial Photographs, (1:30,000).

- Field Reconnaissance.

- Anon, 1982, Ontario Heronry Inventory, Vol. 2, prepared by the Long Point Bird Observatory for the Canadian Wildlife Service and Ontario Ministry of Natural Resources.

- Stream Fish Communities Map, 1975, prepared by Ontario Hydro, (1:250,000).

- Biological Features Map, 1980, prepared by the Planning Department, RMOC, (1:100,000).

- Argus, G.W., and D.J. White, 1982, Atlas of the Rare Vascular Plants of Ontario, Botony Div., National Museum of Natural Sciences, Ottawa, 23 p. + appendix.

- Hoffman, D., 1979, Wetlands... for value received, Ontario Naturalist, Vol. 19, No. 2, pp. 30-37.

- Reid, R., 1979, FON's wetlands policy, Ontario Naturalist, Vol. 19, No. 2, pp. 42-45.

- Lonard, R.I., et al., 1981, Analysis of Methodologies Used for the Assessment of Wetlands Values, US Water Resources Council, Washington, D.C., 68 p. + appendices.

- Anon, 1983. An Evaluation System for Wetlands in Ontario, prepared by Environment Canada and the MNR.

- NCC Forest Resource Inventory Maps.

Personal Contacts

- Ministry of Natural Resources

Queen's Park (Toronto)

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Irene Bowman - Wildlife Branch

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Trevor Keller - Regional Biologist

District Offices

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- Peter Josephs* - District Planner
- Daphne Hope - District Planner
- Harry McLeod - District Biologist
- Rene Jones - Fisheries and Wildlife Supervisor
- Ken Schonauer - Parks Supervisor
- Patrick Ferris - Lakes Planner
- Robin Rogers - Lands Supervisor

Cornwall
- Bryan McCue - Lands Coorindator
Mike Eckersley - District Biologist
Bob Ramsbottom

- Raisin River Conservation Authority (Martintown)

Andy Code - Planner
Mike Lalonde - Assistant Manager

- Rideau Valley Conservation Authority (Manotick)

Cliff Craig - Planner

- South Nation River Conservation Authority (Berwick)

Dell Howett - Planner
Jim Windsor - Manager

- Ottawa Field Naturalsits

Linda Maltby

- Canadian Wildlife Service

  Linda Maltby

- National Capital Commission

  Stewart Harnill

B1.4 FOREST RESOURCES

Data Types

(1) Forest Management Areas (ERFMA)

- W.I.A. - WIA
- agreement forest - AGRFT
- Forest experiment area - EXPAR
- Conservation Authority forest - CONAR
- seed collection area - SEEDA
- Domtar forests - DOMFT

(2) Productivity of Forest Land (ERFLP)

- high productive forest land - HIPFL
- low productive forest land - LOPFL

(3) Forest Maturity (ERFMT)

- mature forest - MATUR
- immature forest - IMMAT
- young forest - YOUNG
- all-age stands - ALAGE

(4) Forest Associations (ERFAS)

- valuable hardwood species - VALHW
- valuable softwood species - VALSW
- intermediate value hardwoods - ITVHW
- intermediate value softwoods - ITVSW
- mixed woods of valuable species - MWVAL
- mixed woods of valuable and intermediate value species - MWVAI
- inferior hardwood or softwood species - INHAS
- conifer plantations - PLTSW
- hardwood plantations - PLTHW
- mixed wood of intermediate value species - MWITV
- sugar bush - SUGAR

Data Sources and Contacts

Published and Unpublished Data

- WIA Tract Maps, Carleton Place District, MNR, 1982, (1" = 10 chains - 20 chains).
- Ontario Base Map (OBM) with Forest Stand Information (Draft), Carleton Place District, MNR, 1982, (1:10,000).
- Crown Land, WIA and Agreement Forests Map, Ottawa District, MNR, 1978, (1:84,000).
- Carleton Place District Land Use Strategy, Draft Strategy, 1982, prepared by the Carleton Place District, MNR, 67 p.
- Cornwall District Land Use Strategy, Draft Strategy, 1982, prepared by the Cornwall District, MNR, 61 p.
- Crown Land, WIA, Agreement Forest and Conservation Areas Map, Cornwall District, MNR, 1980-81, (various scales: 1:3,960 - 10,000).
- Forest Stand Maps, Forest Resources Inventory, MNR, 1978, (1:10,000 photomosaic).
- Forest Resources Inventory, ground sample information, 1980, prepared by MNR, (1:10,000).
- Forestry Agricultural Resources Inventory of Eastern Ontario (FARINEO), 1982, prepared by the Foodland Development Branch for OMAF, 87 p. + computer data.
- Warwick, B.W., 1970, Prospects of Poplar Tree Production in the Kemptville District (unpublished), Eastern Region, MNR, 18 p.
- Morley, P.M., 1981, Private forest land management thriving in Eastern Ontario, Pulp and Paper Canada, Vol. 82, No. 4, pp. 45-49.
- Wood Production and Conversion in Eastern Ontario, Phase I: Wood Supply Conversion Technology and Markets, 1982, prepared by Peat, Marwick and Partners Mgmt. Consultants for the Ministry of Energy, 166 p.
- Willits, C.O., and C.H. Hills, 1976, Maple Syrup Producers Manual, Agr. Handbook No. 134, USDA.
- Agriculture Statistics for Ontario, 1981, prepared by the Ministry of Agriculture and Food.
- The Farm Woodlot, 1974, prepared by MNR.

- Smyth, J.H., and I.A. Nausedas, 1982, Rural Lands and Landowners of Ontario: A Private Land Forestry Perspective, a cooperative study prepared by the Canada-Ontario Joint Forestry Research Committee for the MNR and Env. Canada, 97 p.

- South Nation River Basin Development Study, Report No. 7: Forestry Component, 1981, prepared by Arbex Forest Development Co. Ltd. for the South Nation River Conservation Authority, 33 p.

- Forest Cover Map of the Ottawa Greenbelt, 1975, prepared by the Forest Management Institute, Env. Canada, (1:10,000).

- Land Capability for Forestry Map, 1975, Canada Land Inventory, (1:250,000).

- National Capital Commission Greenbelt Map, 1974, (1:25,000).

- Regional Municipality of Ottawa-Carleton Map, 1981, prepared by the Planning Department, RMOC, for Ontario Hydro, (1:100,000).

- Domtar Forest Products, Property Map, 1981, (1:10,000).

- Interpretation of 1979 Aerial Photographs, (1:30,000).

- Field Reconnaissance.

- Sugar bushes and plantations identified by property owners by lot and concession.

Personal Contacts

- Ministry of Natural Resources

Queen's Park (Toronto)

Brian Cardwell - FRI Supervisor
Art Manley - Air Photo Interpretation Supervisor
Al Nausedas - Economist
Bill Wardle - Economist

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Hank Devries - Forest Resources Branch

District Offices

Cornwall - Geoff Higham - Management Forester
- Russell Scott Reid - Management Forester
- Art Marvin - Private Land Forest Technician

Carleton Place - Jim McCready - Forest Section Supervisor

- Domtar Forest Products (Cornwall)

Gerrit "George" Velema - Resident Forester, Cornwall
Russell Loszkowiat - Senior Forest Technician, Cornwall
Carl Burke - Senior Forest Technician, Cornwall

- South Nation River Conservation Authority (Berwick)

Mike Garrett* - General Manager

B1.5 HERITAGE RESOURCES

Data Types

(1) Known Archaeological Sites (ERKAS)

- confirmed (Borden) sites - CONFD
- reported but unsubstantiated sites - UNSUB

(2) Known Historical Sites (ERKHS)

- settlements - 01

(3) Areas of Historical Significance (ERAHS)

- settlements - 01
- railways - 03
- roads - 04

(4) Cultural Landscapes (ERCL)

- intensive agrarian - A
- intensive - abandoned agrarian - AA
- marginal - abandoned agrarian - MA
- natural - N
- urban - U
- water based/recreational - WBR

(5) Areas of High Paleo-Indian Archaeological Potential (ERPAL)

- Paleolithic areas - PALEO

(6) Areas of High Initial Woodlands Archaeological Potential (ERINI)

- Initial Woodlands areas - INITL

(7) Areas of High Terminal Woodlands Archaeological Potential (ERTWD)

- Terminal Woodlands areas - TERM

Data Sources and Contacts

Published and Unpublished Data

Historical

- Ontario Historic Sites, Museums, Art Galleries and Plaques, 1978, Heritage Administrative Branch, Ministry of Culture and Recreation, 260 p.
- Heritage Mapping of the South Nation River Basin, 1980, prepared by Historic Research Ltd. for the SNRCA, 20 p. + illustrations.
- Historical Society publications and brochures.
- Topographic Map Series, (1:50,000).
- Canadian Inventory of Historic Buildings files, Parks Canada, Ottawa.
- Illustrated Historical Atlas's for the Counties of Stormont, Dundas and Glengarry (1879); Carleton (1879); Prescott, Russell, Stormont, Dundas and Glengarry (1881).

Archaeological

- Borden Sites - identified archaeological sites provided by Ministry of Citizenship and Culture, Regional Archaeologist.
- Pendergast, J.F., 1981, Potential Pre-Historic Archaeological Sites in The Ontario Hydro Eastern Ontario Route Stage Study Area, (unpublished), prepared for Ontario Hydro, 98 p.

Personal Contacts

Historical

- Ministry of Citizenship and Culture

  Queen's Park (Toronto)

  Marilyn Miller - Heritage Planner
  Mark Fram - Heritage Planner
  Barbara McPhail - Heritage Planner
  Pamela Craig - Heritage Planner

  Ottawa

  Phillip Wright - Regional Archaeologist

- Parks Canada (Ottawa)

  Barbara Humphreys - Canadian Inventory of Historic Buildings

- Historical Societies

Mrs. P. McIntosh - Cornwall Township Historical Society
Mrs. J.C. Burns - The Historical Society of Ottawa
Mrs. C. Grandmaison - The Historical Society of Ottawa
Mrs. A.K. Johnston - Gloucester Historical Society
Mrs. E.L. Macartney - Carleton, West-Russell Historical Society
Miss Jean Cameron - Glengarry, Dundas, Stormont Historical Society
Ms. B. Sargeant - Ontario Historical Society
Mr. D. Gray - Osgoode Township Historical Society
Mrs. G. Blair - Osgoode Township Historical Society
Ms. L. Cameron - Stormont, Dundas and Glengarry Historical Society
- La Societe Franco - Ontarienne D'Histoire et Genealogie
T.G. Lemieux - Glengarry Historical Society

- City of Nepean

S.A. Cunliffe - Planning Department

- Smiths Falls Museum Board

Mrs. J. Hogan

- National Capital Commission (Ottawa)

R. Latte - Interpretation and Heritage
A. Merriam - Interpretation and Heritage

- Local Architectural Conservation Advisory Committee (LACAC)

Mr. D. Carter-Edwards - City of Cornwall
Mr. H. Ali-Kanati - Township of Cumberland
Ms. N. Smith - City of Ottawa
Mr. K. Johnston - City of Gloucester

Archaeological

- Archaeological Consultant

James F. Pendergast - Merrickville, Ontario

B1.6 HUMAN SETTLEMENT

Data Types

(1) Existing Land Use (ERXLU)

- urban settlements - URBAN
- rural residential concentrations - RURAL
- non-urban commercial/industrial/institutional concentrations - NONUR

- airports and airfields - AIRPT
- sewage lagoons, waste disposal sites, dumps, auto wrecking yards - WASTE
- communication towers (radio microwave, T.V., etc.) - TOWER

(2) Proposed Other Use (ERPOU)

- approved subdivisions - APROV
- pending subdivisions - PEND
- airport - AIRPT

(3) Linear Land Use (ERLLU)

- gas pipeline - GAS
- oil pipeline - OIL
- numbered highway - HWY
- railway - RAIL
- highway + railway - HWYR
- telephone lines - TELE
- telephone line + railway line - TERA
- telephone line + railway line + highway - TRH
- gas + railway - GASR
- gas + highway - GASH
- abandoned railway - ABRA
- telephone lines + highways - TEHW
- gas line + telephone lines - GAST
- oil line + railway - ORAI
- oil line + highway - HWYO

(4) Power Transmission Lines (ERPTL)

- power transmission lines - 115 kV or greater - LINE
- other lines - PTL

Additional Data Types - Route Level (1:15,000)

(1) Existing Land Uses

- residences - permanent and seasonal
- farmsteads, including residence
- abandoned farms and residences
- barns or storage buildings removed from the residence
- commercial industrial and institutional buildings
- churches and cemetaries

(2) Proposed Other Use

- approved commercial or industrial subdivisions

Data Sources and Contacts

Published and Unpublished Data

- Department of Highways County Maps, 1969, (1 inch = 2,645 ft)

  United Counties of Stormont, Dundas and Glengarry
  United Counties of Prescott and Russell
  Regional Municipalities of Ottawa/Carleton - East and West Portions

- Regional Municipality of Ottawa-Carleton Existing Land Use Map, 1981, prepared by the Planning Department, RMOC, for Ontario Hydro, (1:100,000).

- Regional Municipality of Ottawa-Carleton Proposed Land Use Map, 1981, prepared by the Planning Department, RMOC, for Ontario Hydro, (1:100,000).

- Zoning Map for Southern Ontario, Revised May, 1980, Ministry of Housing, (1:100,000).

- Official Plan Designations for Southern Ontario, Revised May, 1980, Ministry of Housing, (1:100,000).

- Minister's Zoning Orders for Southern Ontario, Revised May, 1980, Ministry of Housing, (1:100,000).

- Committees for Southern Ontario, Revised May, 1980, Ministry of Housing, (1:100,000).

- Municipal Official Plans:

  Cambridge
  Charlottenburgh
  Clarence
  Cornwall (City)
  Cornwall (Township)
  Cumberland (Rural)
  Cumberland (Urban)
  Glengarry
  Gloucester
  Lower St. Lawrence
  North Dundas
  North Leeds
  Osgoode
  Osnabruck
  Ottawa-Carleton
  Russell
  South Nation

- Municipal Zoning By-laws:

  Clarence
  Cumberland
  Roxborough

- Ministry of Municipal Affairs and Housing, Subdivision Applications Files, 1976, 1977, 1978, 1979, 1980, 1981, 1982 and 1983.

- Subdivision Applications Maps, 31B-13, 31C-2, 31C-7, 31C-8, 31C-9, 31C-10, 31C-15, 31C-16, 31F-1, 31F-2, 31G-1, 31G-2, 31G-3, 31G-4, 31G-6, 31G-7, Ministry of Municipal Affairs and Housing, (1:50,000).

- Sarnia to Montreal Extension Map, 1981, Interprovincial Pipe Line Limited.
- Toronto to Montreal to Ottawa Line Map, 1978, Trans Canada Pipelines, (1:50,000).
- Route Maps, Trans-Northern Pipe Line Company, 1975, (1:50,000).

  Drawing M/1644, Rev. 1, Montreal-Kingston
  Drawing M/1646, Farran's Point-Ottawa
- Ontario's Airports and Facilities Map, 1978-1979, Ontario Ministry of Transportation and Communications, (1:63,360).
- Ottawa/Gatineau Area Aviation Master Plan, 1980, prepared by Aviation Planning Services for Transport Canada.
- Gierman, D.M., 1976, Rural Land Use Changes in the Ottawa-Hull Urban Region, Ottawa, Lands Directorate, Environment Canada, Ottawa, 85 p.
- Eastern Ontario Plan Stage Environmental Assessment, 1980, prepared by Ontario Hydro, 141 p. + appendices.
- Eastern Ontario Plan Stage Environmental Assessment, Public Involvement and Environmental Process Support Document, 1980, prepared by Ontario Hydro, 77 p. + appendices.
- Brockville District Land Use Strategy, Draft Strategy, 1982, prepared by the Brockville MNR, 66 p.
- Carleton Place District Land Use Strategy, Draft Strategy, 1982, prepared by the Carleton Place District, MNR, 67 p.
- Cornwall District Land Use Strategy, Draft Strategy, 1982, prepared by the Cornwall District, MNR, 61 p.
- Hopkins, P.S., 1980, Ontario Land Surveyor, County Map of Lennox and Addington, South Portion, Bath, Ontario.
- Interpretaton of 1979 Aerial Photographs, (1:30,000).
- Ontario Hydro, Listing of Municipal Planning Areas and Documents, 1981; updated in 1983.
- Land Use in the Regional Municipality of Ottawa-Carleton Maps, 1975, prepared by the Planning Department, RMOC, (1:100,000).
- Topographic Map Series, (1:50,000).
- VFR Supplement, 1980, DND Flight Information Publ. GPH200A, Surveys and Mapping Br., Department of Energy, Mines and Resources, Ottawa, 130 p.

Personal Contacts

- Ministry of Municipal Affairs and Housing

Queen's Park

Sharane Bellamy - Planner
Elizabeth Lea - Planner
Michael Saunders - Planner
Estelita Segador - Technician
Pat Sheppard - Planner
Linda Tennant - Planner

Regional Community Planning Advisory Branch (Ottawa)

Shane Kennedy - Manager
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David Root - Planner
Dennis Jacobs - Planner
Wayne Belter - Planner

- Regional Municipality of Ottawa-Carleton

Barry Edgington - Senior Planner
Nigel Brereton - Manager, Rural Policy
Daniel Nixey - Planner
Gord Miller - Director, Plans Administration Division
Janet Babcock - Planner

- Ministry of Transportation and Communications

Regional Office (Kingston)

S. Radbone - Manager, Engineering & Right of Way Section
Tony Jones - Planning and Design Section

- Ministry of Natural Resources

Regional Office (Kemptville)

Bill Maslin - Regional Lands Coordinator
Bill Hiscock - Regional Planner

- Transport Canada (Toronto)

John Tron - Airports Group
Bob Rapier - Civil Aviation Group

- Regional Assessment Commissions

Stormount, Dundas and Glengarry

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G.H. Meridith - Regional Assessment Commissioner

- Interprovincial Pipe Line Ltd. (Toronto)

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- Trans Canada Pipelines (Toronto)

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W. Watt - Environmental Analyst

- Trans Northern Pipelines (Toronto)

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- National Capital Commission (Ottawa)

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Aileen Merriam - Director, Interpretation
Stewart Hamill - Chief of Conservation
Shirley Black -
Don Lancaster - Surveys Branch

- United Counties of Stormont, Dundas and Glengarry (Cornwall)

Chuck Miller - County Planner

- City of Cornwall

Michael Otis - Director of Planning
Gary Wood - Senior Planner
Debbie Wylie - Planner

- City of Gloucester

John Reid - Planning Director

- Cumberland Township (Navan)

Mr. N. Lathrop - Director of Planning

B1.7 MINERAL RESOURCES

Data Types

(1) Sensitive Soils (ERSS)

- routine geotechnical investigation necessary - 3
- detailed geotechnical investigation necessary - 4

- will require extensive remedial measures - 5
- unsuitable for construction - 6

(2) Unique Geologic Features (ERUGF)

- class 1 site - CL 1
- class 2 site - CL 2
- class 3 site - CL 3

(3) Existing Mineral Industries (ERXML)

- active licenced and unlicenced pit sites - PIT, LPIT
- active licenced and unlicenced quarry sites - QUARY, LQURY

(4) Possible Sand and Gravel Reserves (ERPSG)

- possible sand and gravel reserves - PSGR

Data Sources and Contacts

Published and Unpublished Data

- Billings, M.D., 1975, Geological Sites and Features in the Regional Municipality of Ottawa-Carleton, prepared for the RMOC, 49 p. + appendices.
- Fletcher, T. and M. Klugman, 1979, Aggregate Assessment of the Regional Municipality of Ottawa-Carleton, MNR, 44 p.
- Klugman, M. and P. Chung, 1976, Slope Stability Study of the Regional Municipality of Ottawa-Carleton, OGS Misc. Paper MP68, 13 p.
- Ongley, E.D., 1965, A Study of Caves in Southern Ontario, BA thesis, University of Toronto, 117 p.
- Papertzian, C.R., 1980, A Compilation of Earth Science Data for the Provincial Parks Systems Plan, Eastern Admin. Region (1975, 1979, 1980), Div. of Parks, MNR, 63 p. + appendices.
- Mineral Aggregate Study and Geological Inventory - Part of the Eastern Ontario Region, 1975, prepared for MNR by Proctor and Redfern Ltd. and Gartner Lee Assoc., Ltd.
- Sado, E.V., and M.A. Vos, 1976, Resources of Construction Aggregate in the Regional Municipality of Ottawa-Carleton, OFR 5218, Div. of Mines, MNR, 74 p.
- Mineral Resource Policies for Ottawa Carleton (Draft), 1981, prepared by RMOC, 25 p.
- Pit and Quarry License Applications, MNR District Offices.

- Mine Site Locations, compiled by the Assessment File Research Office, OGS, MNR.
- Leda Clay Survey Map (unpublished), prepared by the Eastern Regional Office, MNR, for the Cornwall and Carleton Place Districts.
- Pit and Quarry Location Maps (unpublished), prepared by MNR District Offices, various scales and dates.
- Geologic and Aggregate Maps for the RMOC (unpublished), various scales and dates.
- Satterly, J., 1944, Mineral Occurrences in Lanark County, Ontario Dept. of Mines, Toronto, 195 p.
- Mineral Aggregate Resource Planning Policy (Approved Dec. 22, 1982), Ministry of Natural Resoures.
- Gorrell, G.A., and T.W. Fletcher, 1983, Sand and Gravel Assessment for the United Counties of Stormont, Dundas and Glengarry, MNR, OGS, OFR 5434, 54 p. and attachments.
- Gorrell, G.A., and T.W. Fletcher, 1983, Sand and Gravel Assessment for the United Counties of Prescott and Russell, MNR, OGS, OFR 5433, 33 p. and attachments.
- Powell, R.D., and M.A. Klugman, 1979, Silica Sand Potential in Eastern Ontario, Prelim. Rpt. I, OGS, OFR 5265, 110 p. and attachments.
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- MNR District Sensitive Area Reports
- MNR Preliminary Peat Maps, 1979, (1:50,000).
- NCC Land Use Map, 1974, (1:25,000).

- Topographic Map Series, (1:50,000).

- Interpretation of 1979 Aerial Photographs, (1:30,000).

- Field Reconnaissance.

Personal Contacts

- Ministry of Natural Resources

  Queen's Park (Toronto)

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  - Mac MacDonald - Pits and Quarries Inspector
  - Terry McManus - Pits and Quarries Inspector
  - Daphne Hope - District Planner

  Cornwall
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  - Brad Fairley* - Technician
  - Dave Willis - Minerals Supervisor

- Ministry of Transportation and Communications

  Regional Office (Kingston)

  Dave McIvoy - Environmental Analyst

- Property Owners

B1.8 RECREATION RESOURCES

Data Types

(1) Existing Recreation (ERXRC)

- federal parks - 1
- conservation areas/RMO-C recreation-conservation areas - 3
- private parks and campgrounds/bible camp/scout camp - 4
- riding stable - 5

- rifle range/skeet club - 6
- tent or trailer park - 8
- stadiums/arenas - 9
- fairgrounds - 10
- speedways - 10A
- golf courses - 12
- conservation authority-reforestation area - 32

(2) Proposed Recreation (ERPRC)

- conservation authority reserves/proposed regional park - 3

(3) Ski Trails (ERSKI)

- Pine Grove Trail - PGROV
- Mer Bleue Trail - MBLEU
- Pinhey Trail - PINEY

Data Sources and Contacts

Published and Unpublished Data

- Ontario Recreation Supply Inventory - Tourism and Outdoor Recreation Planning Study, Users Manual, 1975, Parks and Recreational Areas Branch, MNR, 14 p. + appendices.

- Ontario Recreation Supply Inventory - computer output by township and county, + associated maps, (1:50,000).

- Tourism Development Opportunities: Trenton-Cornwall Zone, 1975, Renfrew-Kingston Zone, prepared by De Leuw Cather (Canada) Ltd. for the Ontario Ministry of Industry and Tourism, 88 p. + appendices.

- Preliminary Evaluation of Ontario Waterways for Provincial Park Purposes, 1980, Parks and Recreational Areas Branch, MNR, 82 p.

- Ottawa Valley Parkway, 1974, prepared by Hough, Stansbury and Assoc. Ltd. for the Ontario Ministry of Industry and Tourism, 57 p. + appendices.

- Conservation Authority - annual reports, brochures, maps
  - Raisin River Conservation Authority
  - Rideau Valley Conservation Authority
  - South Nation River Conservation Authority

- CORTS, policy statements and pamphlets.

- Ontario Ministry of Natural Resources, various brochures and maps.

- A Method for Determining the Recreational Impact of High Voltage Transmission Lines for Ontario Hydro (Draft), 1982, prepared by Landplan Collaborative Ltd. for Ontario Hydro.

- South Nation River Conservation Authority Amenity System Study, 1981, prepared by Hough, Stansbury and Michalski Ltd. for the SNRCA, 70 p. + appendix.

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- Cornwall District Land Use Strategy, Draft Strategy, 1982, prepared by the Cornwall District, MNR, 61 p.

- Regional Municipality of Ottawa-Carleton (RMOC) Map, Regional Forest - West Rideau Township - Hiking Trails, 1978, (1:50,000).

- RMOC, various brochures and publications.

- Mer Bleue Conservation Area Development Plan, National Capital Commission (NCC), March 1982, 60 pages.

- NCC Winter Trails Maps, 1979, (1:25,000).

- NCC Greenbelt Map, 1974, (1:25,000).

- Conservation Lands in Ottawa-Carleton, Background Reports 1-5, 1976, prepared by the Planning Department, RMOC.

- Conservation Lands in Ottawa-Carleton, River Corridors and Conservation Areas Project, 1977, prepared by the Planning Department, RMOC, 74 p. + technical appendix.

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- Topographic Map Series, (1:50,000).

- Interpretation of 1979 Aerial Photographs, (1:30,000).

- Field Reconnaissance.

Personal Contacts

- Ministry of Natural Resources

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- Ken Schonauer - Parks Supervisor
- Robin Rogers - Lands Supervisor

Cornwall - Bryan McCue - Lands Co-ordinator

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Cliff Craig - Planner

- South Nation River Conservation Authority (Berwick)

Susan Beckman* - Planner

- Regional Municipality of Ottawa-Carleton

Nigel Brereton - Manager, Rural Policy
Daniel Nixey - Planner

- National Capital Commission (Ottawa)

Alan Ede - Director, Parks and Public Activities

- Property Owners

B1.9 ENGINEERING/COST CONSTRAINTS

(1) Rivers (ERRVR)

- rivers - RIVER

(2) Sensitive Soils (ERSS)

- routine geotechnical investigation necessary - 3
- detailed geotechnical investigation necessary -4
- will require extensive remedial measures - 5
- unsuitable for construction - 6

(3) Landslide Areas (ERLA)

- slide areas - SLIDE

(4) Unique Geologic Features (ERUGF)

- class 1 site - CL1
- class 2 site - CL2
- class 3 site - CL3

Data Sources and Contacts

Published and Unpublished Data

- Billings, M.D., 1975, Geological Sites and Features in the Regional Municipality of Ottawa-Carleton, prepared for the RMOC, 49 p. + appendices.

- Klugman, M. and P. Chung, 1976, Slope Stability Study of the Regional Municipality of Ottawa-Carleton, OGS Misc. Paper MP68, 13 p.

- Ongley, E.D., 1965, A Study of Caves in Southern Ontario, BA thesis, University of Toronto, 117 p.

- Papertzian, C.R., 1980, A Compilation of Earth Science Data for the Provincial Parks Systems Plan, Eastern Admin. Region (1975, 1979, 1980), Div. of Parks, MNR, 63 p. + appendices.

- Leda Clay Survey Map (unpublished), prepared by the Eastern Regional Office, MNR, for the Cornwall and Carleton Place Districts.

- MNR District Sensitive Area Reports.

- CORTS, various brochures, pamphlets and policy statements.

- Topographic Map Series, (1:50,000).

- Interpretation of 1979 Aerial Photographs, (1:30,000).

- Field Reconnaissance.

Personal Contacts

- Ministry of Natural Resources

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Tom Fletcher - Mineral Resources Manager
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B1.10 POLITICAL FABRIC

(1) County Boundaries (ERCYB)

- Dundas - DUNDS
- Glengarry - GLENY
- Prescott - PRSCT
- Russell - RUSEL
- Stormont - STRMT

(2) Townships (ERTWP)

Cambridge
Clarence
Cumberland
Lancaster
Osnabruck
Russell
Winchester
Charolottenburgh
Cornwall
Finch
Osgoode
Roxborough
South Plantagenet

(3) City Limits (ERCTY)

Ottawa - OTAWA
Maxville - MAXVL
Alexandria - 1
Lancaster - LANCR
Williamstown - WILMN
Martintown - MARTN
Cornwall - 1
Casselman - 1
Winchester - WINCH
Finch - 1
Gloucester - GLSTR
Chesterville - 1

(4) Planning Areas (ERGPA)

Reg. Mun. of Ottawa-Carleton - OTTCH
Russell - RUSEL
South Nation - NATIN
North Dundas - DUNDS
Glengarry - GLENY
Lower St. Lawrence

(5) National Capital Commission (ERNCC)

- National Capital Commission - NCC

(6) Land Tenure (ERLTN)

- Crown land - 1
- Federal land (DND, NCC, Agr. Can., DEMR, Parks Canada, Dept. of Transport) - FEDLD
- Conservation authority land - CONLD
- Provincial park land - PROLD
- Municipal land - MUNLD

(7) Concession Lines (ERCON)

- concession lines - CON

Published and Unpublished Data

Data Sources and Contacts

- Provincial Ministries: Municipal Affairs and Housing
  M.T.C. (county maps)
  M.N.R. (administration maps)
- Area Planning Boards
- Official Plans
- County Clerks/Town Clerks
- R.M.O.C.
- Topographic Map Series, (1:50,000)

B1.11 BASE MAPS

Data Types

(1) Eastern Ontario Study Area (ERSTA)

(2) Eastern Ontario Factor Maps - East

- Agricultural Resources - EREAR
- Appearance of the Landscape - EREAL
- Biological Resources - EREBR
- Forest Resources - EREFR

- Heritage Resources - EREHR
- Human Settlement - EREHS
- Mineral Resources - EREMR
- Recreation Resources - ERERR
- Engineering/Cost Constraints - ERFEC

(3) Eastern Ontario Constraint, Diversity Maps - East

- Constraint Map - ERERG
- Diversity Map - FERNFC

(4) Eastern Ontario Corridor Maps - East

- Corridors - ERFC1

(5) Eastern Ontario Route Maps - East

- Routes - ERER1

APPENDIX B2

OBJECTIVE STATEMENT

FORMAT AND CRITERIA

OBJECTIVE

To avoid a geographically defined land use or environmental situation.

DESCRIPTION

The data types used to define the situation are described, and the general location, extent, or percentage occurrence in the study area is outlined.

RESOURCE VALUE

This section describes the importance of each situation to the local and/or regional land use or resource base (including economic, social, bio-physical and aesthetic considerations).

The importance of the resource can be described in terms of:

> Significance: of the situation to the land use and/or resource base (varies according to officially stated policies or regulations, and/or bio-physical quality);
>
> Prevalence: of the situation in a local and/or regional context (varies according to its pattern of occurrence, relative abundance or scarcity, its availability or accessibility, its ownership or regulation);
>
> Sensitivity: of the situation to change, or to resist change (varies according to the assessment of "risk" of adverse effect on the present condition of the situations, the necessity or desirability to maintain the present or future state of the situations, and the degree of maintenance required to do so);
>
> Interrelationships: among situations, as they pertain to the condition-action-response relationships in the environment (includes a holistic assessment of interrelationships among resources, officially stated or approved land use policies or regulations and the land use infrastructure).

POSSIBLE EFFECTS

This section describes the magnitude of physical or perceptual changes to situations that may occur through related transmission line development activities.

The magnitude of the possible effects can be described in terms of:

Type: of possible effects resulting from a proposed action, either a direct effect on the land use or environmental characteristics, or an indirect effect on secondary characteristics or processes (direct or indirect). This includes contravention of officially stated or approved land use policies or regulations;

Extent: of possible effects (spatially), confined to the immediate area or wide spread (on-site and/or off-site).

Intensity: of possible effect on each environmental situation (low, moderate, or high degree of change);

Duration: of possible effects over time (short or long term);

Frequency: of possible effects as a result of one or more repetitions of a construction event, or by multiple events (single or cumulative effects);

Probability: of possible effect on each environmental situation (low, moderate or high risk of effect).

POSSIBLE MITIGATION

This section identifies, in general terms, the measures that Ontario Hydro could apply to avoid or to minimize anticipated impacts if the situation cannot be avoided.

The possible mitigation measures can be described in terms of:

Reversibility: of possible effects over time and space, either through natural restoration of a balance between forms and process, or through implementation of vegetative and/or structural remedial measures;

Other: planning activities that have an influence on possible effects, such as timing construction activities with the seasons of the year, applying construction techniques which minimize effects (see: Construction and Site Restoration Guidelines for Transmission Facilities, 1981, prepared by Ontario Hydro, 67 p.), or changing land use policies or regulations.

APPENDIX B3

ENVIRONMENTAL FACTORS AND OBJECTIVE STATEMENTS

B3.1 Agricultural Resources

1. Specialty crop production areas and CLI soil capability class 1 in agriculture
2. CLI soil capability classes 2 or 3 in agriculture with drains
3. CLI soil capability classes 2 or 3 in agriculture without drains
4. CLI soil capability class 4 in agriculture

B3.2 Appearance of the Landscape

1. Viewsheds of existing settlements
2. Landscapes that are characterized as natural
3. Viewsheds of highways in flat, untreed landscapes

B3.3 Biological Resources

1. Rare/unique, sensitive or significant biological areas
2. Biologically sensitive wetlands
3. Deer winter concentration areas
4. Waterfowl habitat
5. Cold and warm water fisheries
6. Wetlands with no identified biological significance

B3.4 Forest Resources

1. Seed production areas, experimental forest areas, maple sugar operations
2. Intensively managed forest areas
3. Valuable species - young to mature forests
4. Intermediate to low value - young to mature forests

B3.5 Heritage Resources

1. Confirmed archaeological/known historical sites
2. Potential archaeological sites and areas
3. Historically representative cultural landscapes

B3.6 Human Settlement

1. Existing urban settlements
2. Existing strip developments
3. Existing institutional, commercial and industrial
4. Approved residential developments

B3.7 Mineral Resources

1. Active pits and quarries

2. Areas of high sand and gravel reserve potential
3. Geologic sites and features with known value

B3.8 Recreation Resources

1. Conservation areas
2. Existing private/commercial/public facilities

B3.9 Engineering/Cost Constraints

1. Sensitive/unique geologic features

B3.1 AGRICULTURAL RESOURCES

B3.1.1 AGRICULTURAL RESOURCES 1

OBJECTIVE

Avoid areas with existing specialty crop production and areas with Canada Land Inventory (CLI) soil capability class 1 in agricultural land use.

DESCRIPTION

Speciality crops include fruits and vegetables and sod farms. Sod farms are included in this category because of their similar management inputs (e.g., irrigation, weed and pest control).

Areas presently used for specialty crop production are very limited within the study area. With the inclusion of class 1 agriculture, this situation occupies approximately 3.5 percent of the east section.

CLI class 1 soils generally have no limitations to crop growth and, hence, are considered to be the most productive soils.

The agricultural land (excluding specialty crops) within the study area has been identified under the following agricultural land use systems: monoculture (continuous cultivation of corn or cereal grains), corn (40 to 75 percent corn with hay, cereal grains and pasture in rotation), mixed (less than 40 percent corn with hay, cereal grains and pasture in rotation), hay (rotation of hay, cereal grains and pasture, largest proportion hay), pasture (hay and pasture in equal quantities) and grazing (permanent pastures with small portion of hay).

RESOURCE VALUE

- The scarcity of specialty crop areas in eastern Ontario make them a regionally significant resource.

- Tender fruit and vegetable growing areas are given highest priority for preservation in the Ontario Foodland Guidelines (1978 provincial agricultural planning policy).

- CLI class 1 soils are the best soils for sustained cultivation of common field crops, and are given high priority for preservation in the Ontario Foodland Guidelines.

- Farm operations within this objective contribute significantly to the economic stability of their support services through the purchasing of such things as machinery, fertilizers and herbicides.

POSSIBLE EFFECTS

- The construction and presence of towers on specialty agriculture land may have a significant economic impact on these relatively small specialized farming operations growing high-value crops.

- Towers may reduce the operational efficiency or restrict the use of specialized machinery associated with specialty crops such as high pressure irrigation, aircraft operations or specialized harvesting equipment.

- Soil compaction and rutting from construction can cause a reduction in crop yield along access roads and near tower sites; short term change.

- There may be loss of, or damage to, fruit trees and standing crops from tower construction.

- Damage to sub-surface drainage systems resulting from construction may lower crop yields owing to an excess of moisture.

- The prevalence of row crops such as corn on CLI class 1 soils, and the large size of machinery associated with its cultivation, may cause land to be lost from production because of problems in maneuvering machinery around towers without damaging the machinery or the crop being grown.

- There may be loss of productive food land under, and adjacent to, towers because of problems in maneuvering machinery around towers without damaging the machinery or the crop being grown.

- There may be a reduction in borrowing power for the farm operator if a major portion of land is purchased for the right of way.

- An easement or purchase of land for the right of way may reduce the landowner's ability to control the farm unit such as a restriction to building construction within a right of way.

- Potential interruption of farm management plans, such as the postponing of sub-surface drainage installation along the preferred route until after construction.

- Removal of fence row vegetation increases the potential for wind-borne erosion.

POSSIBLE MITIGATION

- Locate towers along property lines, adjacent to, or straddling fencerows to minimize the land lost from production.

- Avoid or minimize crossings of subsurface drainage systems to prevent damage to drainage tiles from soil compaction. Ontario Hydro will repair tiles broken during construction (see Construction and Site Restoration Guidelines for Transmission Facilities, 1981, by Ontario Hydro, 67 pages).

- Reduce soil compaction and rutting through the following measures:

  - time construction activities on sensitive soils such as organics to frozen or dry soil conditions when the load bearing capacity is the greatest.

  - use filter fabric and gravel for access road construction which can be completely removed after construction.

  - use construction equipment designed to exert minimum ground pressure.

  - stop construction when soil conditions are most unstable.

  - use existing farm lanes or roadways for access, and limit access road width to minimize loss of standing crop and soil compaction.

  - treat access roads and area around tower sites to restore compacted soils.

B3.1.2 AGRICULTURAL RESOURCES 2

OBJECTIVE

Avoid actively farmed land which is tile drained and has a soil capability of CLI class 2 or 3.

DESCRIPTION

CLI soil capability classes 2 and 3 are prime soils for sustaining production of common field crops.

The agricultural land within the study area has been identified under the following agricultural land use systems: monoculture (continuous cultivation of corn or cereal grains), corn (40 to 75 percent corn with hay, cereal grains and pasture in rotation), mixed (less than 40 percent corn with hay, cereal grains and pasture in rotation), hay (rotation of hay, cereal grains and pasture, largest proportion hay), pasture (hay and pasture in equal quantities) and grazing (permanent pastures with small portion of hay).

Tile drainage generally occurs on CLI class 2 and 3 soils with monoculture corn or mixed land use systems.

This situation occupies approximately 11 percent of the east section.

RESOURCE VALUE

- CLI soil capability classes 2 and 3 are prime soils for sustained cultivation of common field crops. The Ontario Foodland Guidelines (1978), which outline Ontario's agricultural planning policy, consider CLI class 2 and 3 soils as high priority agricultural lands for preservation.

- Farm operations within this objective contribute significantly to the economic stability of their support services through the purchasing of such things as machinery, fertilizers and herbicides.

- Tile drainage increases soil productivity on soils with otherwise less than optimal drainage.

- Tile drainage facilities represent a substantial economic investment to farm operators.

- The Ontario Foodland Guidelines identify tile drainage as a high priority management input.

POSSIBLE EFFECTS

- Transmission facilities located on high capability agricultural lands may conflict with provincial planning policies.

- The prevalence of row crops such as corn on the aforementioned soil capability classes, and the large size of machinery associated with its cultivation, may cause land to be lost from production because of problems in maneuvering machinery around towers without damaging the machinery or the crop being grown.

- The transmission line towers may reduce the operational efficiency or restrict the use of machinery around the tower bases, thereby increasing the cost of normal field operations.

- There may be added cost and inconvenience for weed control within tower bases.

- Soil compaction and rutting from construction may cause a reduction in crop yield along access roads and near tower sites.

- Damage to sub-surface drainage systems resulting from construction may lower crop yields owing to an excess of moisture.

- There may be a loss of standing crop if construction occurs between seeding and harvesting.

- There may be a reduction in borrowing power for the farm operator if a major portion of land is purchased for the right of way.

- An easement or purchase of land for the right of way may reduce the landowners ability to control the farm unit, such as restricting the construction of buildings within a right of way.

- There may be an interruption of farm management plans such as postponing sub-surface drainage installation along the preferred route until after construction.

- The removal of fencerow vegetation may increase the potential for wind-borne erosion.

POSSIBLE MITIGATION

- Locate towers along property lines, adjacent to, or straddling fencerows to minimize the land lost from production.

- Avoid or minimize crossings of subsurface drainage systems to prevent damage to drainage tiles from soil compaction.

- Reduce soil compaction and rutting through the following measures:

    - time construction activities on sensitive soils such as organics to frozen or dry soil conditions when the load bearing capacity is the greatest.

    - use filter fabric and gravel for access road construction which can be completely removed after construction.

    - use construction equipment designed to exert minimum ground pressure.

    - stop construction when soil conditions are most unstable.

    - use existing farm lanes or roadways for access, and limit access road width to minimize loss of standing crop and soil compaction.

    - treat access roads and area around tower sites to restore compacted soils.

B3.1.3 AGRICULTURAL RESOURCES 3

OBJECTIVE

Avoid land with Canada Land Inventory (CLI) soil capability classes 2 and 3 in agricultural land use without tile drainage.

DESCRIPTION

The agricultural land use systems are described in Agricultural Resources 1.

This situation occupies approximately 8 percent of the east section.

RESOURCE VALUE

- CLI soil capability classes 2 and 3 are prime soils for sustaining production of common field crops.

- Farm operations within this situation contribute significantly to the economic stability of their support services through the purchasing of such things as machinery, fertilizers and herbicides.

- The Ontario Foodland Guidelines, which outline the Province of Ontario's agricultural planning policy, considers CLI class 2 and 3 soils as high priority agricultural lands.

POSSIBLE EFFECTS

- Same as Agricultural Resources 2, but excluding the effects on tile drainage systems.

POSSIBLE MITIGATION

- Same as Agricultural Resources 2, but excluding possible mitigation for tile drainage.

B3.1.4 AGRICULTURAL RESOURCES 4

OBJECTIVE

Avoid land with Canada Land Inventory (CLI) soil capability class 4 in agricultural land use.

DESCRIPTION

CLI soil capability class 4 is generally best suited for perennial forages.

The agricultural land use systems are described in Agricultural Resources 1.

RESOURCE VALUE

- Although class 4 soils are not generally best suited for corn or cereal grain production, in some areas crop growth may be enhanced by soil management techniques such as tile drainage. This potential for increase in soil productivity is recognized.

- The Ontario Foodland Guidelines (provincial agricultural planning policy) identifies class 4 soils, and any lands exhibiting ongoing viable agriculture, as high priority agricultural land for preservation.

- These areas contribute to the economic stability of the agricultural support services such as machinery dealers, feed stores, fertilizer and chemical suppliers.

POSSIBLE EFFECTS

- Same as Agricultural Resources 2, except that forage crops are prevalent rather than row crops.

- There may be less land lost from production, or potential crop damage during harvesting, because of better farm machinery maneuverability with forage crops.

POSSIBLE MITIGATION

- Same as Agricultural Resources 3.

B3.2.1 APPEARANCE OF THE LANDSCAPE 1

OBJECTIVE

Avoid the viewsheds of existing settlements.

DESCRIPTION

Only the primary viewsheds of cities, towns, villages, and concentrations of rural residential areas (as identified by the Human Settlement factor) are considered. In flat, untreed landscapes, two kilometres was used as the dividing line between primary and secondary viewsheds. Beyond a distance of two kilometres, it was felt that a transmission line ceased to be significant in terms of its effect on viewers.

These viewsheds of concentrations of dwellings incorporate the majority of the population of viewers in the study area. The viewsheds reflect the concern about the effects of transmission lines on people's homes.

This objective has the majority of the situation occurring in the western half (Russell - Casselman area) and occupies approximately 3 percent of the east section.

RESOURCE VALUE

- These viewsheds are moderately to highly sensitive to visual intrusion into the "personal space" of the community/individual.

- The viewsheds in the eastern half of the study area tend to be smaller, with crests in the middleground defining some of the viewsheds. The viewsheds in agricultural areas are generally larger, often overlap between centres, and are defined by trees in the distant background.

POSSIBLE EFFECTS

- The tower lines may be visible for long distances.

- Cresting (direct effect) may result in skylining (indirect effect). Cresting and skylining generally occur at the periphery of the viewshed, as it is often a crest that forms the boundary of a viewshed. The remainder of the changes, while occurring on-site, are generally visible off-site, and their zone of influence goes beyond the right of way itself.

- The removal of vegetation (direct effect) may result in a colour contrast (indirect effect) between the right of way and the surrounding vegetation. This colour contrast is most pronounced during the winter.

- The presence of the towers may result in a contrast with natural elements in terms of scale and character.

- The intensity of each of these effects will vary according to site conditions, but the effects would be very long term, that is, the life of the line.

POSSIBLE MITIGATION

- The contrast between the cleared right of way and forested areas will be reduced, by allowing natural regeneration of compatible plant species on the right of way.

B3.2.2 APPEARANCE OF THE LANDSCAPE 2

OBJECTIVE

Avoid landscapes that are characterized as natural.

DESCRIPTION

This situation is comprised of treed wetlands that are larger than 350 ha.

The areas represented by this objective are few and located in a random manner, occupying 3 percent of the study area.

RESOURCE VALUE

- These wetlands are the only remaining landscapes that have been altered minimally by human activities and therefore form a direct link to past environments.

- Large natural landscapes are uncommon within the east study area and may have visual expectations associated with them that do not include transmission lines.

POSSIBLE EFFECTS

- The removal of vegetation may result in a colour contrast between the right of way and the surrounding vegetation. This colour contrast is often most pronounced during the winter.

- The presence of the towers may result in a contrast between the towers and the natural elements in terms of scale and character.

- The intensity of these effects will be moderate to low. The effects will occur throughout the entire landscape and will be long-term, that is, the life of the line.

POSSIBLE MITIGATION

- The contrast between the cleared right of way and forested areas may be reduced through allowing the regeneration of compatible plant species on the right of way.

B3.2.3 APPEARANCE OF THE LANDSCAPE 3

OBJECTIVE

Avoid the viewsheds of highways in flat, untreed landscapes.

DESCRIPTION

This situation includes the viewsheds of highways 34, 43, 138, 401 and 417. The viewsheds have been limited to a maximum of two kilometres.

RESOURCE VALUE

- These highways provide the main visual impressions of the area.

- These viewsheds are low to moderately sensitive to visual change.

POSSIBLE EFFECTS

- The lines may be visible to a large number of viewers.

- The presence of the towers may result in a contrast with existing structures and patterns in terms of scale and character.

POSSIBLE MITIGATION

- Cross the highways at right angles, if possible, to minimize visual exposure to the line and the right of way.

B3.3.1 BIOLOGICAL RESOURCES 1

OBJECTIVE

Avoid biological areas which are considered rare or unique, sensitive or significant.

DESCRIPTION

This situation includes areas with rare/unusual plants, such as the Ram's Head Lady Slipper, heron rookeries, a moose concentration area, sensitive fish spawning habitat, areas proposed or designated for environmental protection and nature reserves. It occupies approximately 6 percent of the study area.

RESOURCE VALUE

- The floral and faunal species represent unique combinations of habitat characteristics which are very sensitive to change.

- These resources provide unique opportunities for visual and educational experiences and scientific research.

- Protection of rare/unusual flora and/or fauna, and associated habitat, is becoming increasingly important to many government agencies and interest groups throughout Ontario. Many of these floral and faunal species are protected under the Endangered Species Act.

- The habitats associated with these species are necessary to sustain their population levels.

POSSIBLE EFFECTS

- Transmission facilities located in sensitive biological areas may conflict with existing legislation.

- There may be a direct or indirect loss of unique and irreplaceable species.

- Construction activities during critical periods in the species annual cycle may adversely affect such activities as breeding, nesting, and spawning.

- There may be a complete or partial removal of floral and/or faunal habitat, thereby reducing the quality and, ultimately, the carrying capacity for the species present.

- Habitat alteration may encourage the influx of more aggressive and competitive species.

POSSIBLE MITIGATION

- Time construction and maintenance activities to avoid critical periods in the species annual cycle.

- Survey the ROW prior to construction to identify precise locations of these features, and avoid or protect these sites during construction.

- Utilize structural control devices where a vegetative buffer adjacent to aquatic habitats (spawning beds) is insufficient to minimize sedimentation during construction.

B3.3.2 BIOLOGICAL RESOURCES 2

OBJECTIVE

Avoid biologically sensitive wetlands.

DESCRIPTION

Wetlands considered for this objective are those areas that are seasonally or permanently covered by standing water to a depth not generally greater than two metres. They represent 2.7 percent of the study area.

Sensitive wetlands include those identified for known species or habitat.

RESOURCE VALUE

- Wetlands contribute to the maintenance of water quantity and quality conditions through their function as natural water storage reservoirs, filters and regulators of stream flow.

- Wetlands have a high educational value because of the diversity of floral and faunal species present.

- Wetlands often provide a high degree of ecological diversity.

POSSIBLE EFFECTS

- Right of way clearing and construction activities may necessitate the removal of vegetative cover.

- There may be loss of habitat for a variety of floral and faunal species.

- There may be a reduction in plant species diversity.

- There may be rutting, mixing, compacting, and eroding of organic soils.

- Alteration of wetland hydrology may alter water storage capacity, downstream flow conditions, runoff volumes, and initiate erosion and/or flooding.

- Construction operations may initiate passage of contaminants into the aquatic environment, affecting plant and animal life.

- There may be temperature changes resulting from removal of the vegetative cover.

POSSIBLE MITIGATION

- Construction effects may be minimized by timing construction for frozen soil conditions or the use of courderoy or gravel roads over gravel mats.

- Selectively cut vegetative cover.

- Contain contaminants and remove from site.

- Store fuels and lubricants to refuel and service equipment off-site.

- Use tower extensions to maximize retention of vegetation.

B3.3.3 BIOLOGICAL RESOURCES 3

OBJECTIVE

Avoid deer winter concentration areas.

DESCRIPTION

These situations encompass the habitat used by deer during the winter months and represent approximately 2 percent of the study area.

RESOURCE VALUE

- The number of deer yards is diminishing because of competing land use pressures (agriculture, forestry, urbanization). The remaining areas are therefore becoming increasingly critical to the survival of deer.

- These areas provide food and shelter during the critical winter period.

- These habitat areas provide opportunities for recreational activities, such as viewing, interpretation, education and scientific studies.

POSSIBLE EFFECTS

- There may be a complete or partial removal of wildlife habitat, thereby reducing the quality and, ultimately, the carrying capacity for the species present.

- Construction during critical periods in the species annual cycle may adversely affect the deer population by forcing them into less favourable areas of the yard, or by removing prime browse or cover.

- Vegetative control may result in periodic removal of incompatible species along the ROW. The vegetation which becomes established is a new habitat upon which a number of species may become dependent.

- The ROW and access roads may facilitate increased human pressure upon the resource by opening up the yard.

POSSIBLE MITIGATION

- Time construction and maintenance activities to avoid the winter period.

- Use tower extensions to maximize retention of vegetation.

B3.3.4 BIOLOGICAL RESOURCES 4

OBJECTIVE

Avoid waterfowl habitat.

DESCRIPTION

Waterfowl habitat includes the areas known to be used for breeding and/or staging. This represents 1 percent of the study area.

RESOURCE VALUE

- Waterfowl habitat is diminishing because of competing land use pressures (agriculture, forestry, urbanization). The remaining productive areas are therefore becoming increasingly critical to the survival of waterfowl.

- Waterfowl habitat provides opportunities for recreational activities, such as viewing and interpretation, and for educational and scientific studies.

- Waterfowl breeding and staging areas are essential to the maintenance, production, and survival of the species.

- Waterfowl hunting provides a benefit to the local and regional economy.

POSSIBLE EFFECTS

- Construction activities (tower footings, access roads) may alter water storage capabilities thereby adversely affecting the aquatic organisms upon which the waterfowl depend for food and shelter.

- Construction activities may place stress on the waterfowl during critical periods of their annual cycle, for example nesting and staging which may reduce their reproductive success.

- Further loss or degradation of productive waterfowl habitat would be considered critical in light of the limited habitat available.

- Tower lines may interfere with migratory flyways.

POSSIBLE MITIGATION

- Time construction and maintenance activities to coincide with inactive periods within waterfowl habitat areas such as the winter months.

- Restrict vehicular movement, access, and ROW clearing, to minimize disturbance of the habitat.

- Promote the use of indigenous habitat vegetation in order to facilitate site restoration.

B3.3.5 BIOLOGICAL RESOURCES 5

OBJECTIVE

Avoid cold and warm water fisheries.

DESCRIPTION

Warm and cold water fisheries include those lakes, creeks, rivers and marshes where known populations of sport fish occur. They occupy approximately 2.5 percent of the study area.

RESOURCE VALUE

- Cold water fisheries are diminishing as a result of deteriorating water quality to the extent that their preservation is becoming increasingly important.

- Cold water fisheries provide highly sought after recreational resources.

- Warm water fisheries, although more tolerant of water quality alterations, still require protection.

- Warm water fisheries generally provide the major portion of the sport fishery in terms of money and user days.

- Sport fishing represents a major recreational activity and economic benefit to the area.

- The sport or recreational demand for the fishery supports a bait fishery.

POSSIBLE EFFECTS

- Removal of streambank vegetation may increase light penetration and water temperature, which may have varying effects on the aquatic organisms. Paralleling watercourses may alter the habitat by promoting a greater quantity and diversity of aquatic plants and fish as well as raising temperatures to intolerable limits for the indigenous fish species.

- Changes in productivity, water temperature nutrient loading, etc., may favour the coarse fish community.

- Increased sediment yields during construction may cause excess turbidity for short periods of time, possibly reducing water quality and affecting aquatic life.

POSSIBLE MITIGATION

- Time construction and maintenance activities to avoid annual spawning and incubation period of the species.

- Maintain streambank vegetation as a natural buffer to trap sediments and reduce the rate of overland flow and maintain water temperature.

- Where a vegetation buffer is insufficient to minimize sedimentation, utilize structural devices to divert and store sediments.

- Approach waterbodies at right angles to reduce the possible extent of the effect.

B3.3.6 BIOLOGICAL RESOURCES 6

OBJECTIVE

Avoid wetlands with no identified biological significance.

DESCRIPTION

Wetlands represent areas that are seasonally or permanently covered by standing water to a depth not greater than two metres. Wetlands in this objective are exclusive of those contained in Objective 2. Owing to the mapping scale, only those wetlands greater than 25 ha in size have been identified. They represent approximately 1.4 percent of the study area.

RESOURCE VALUE

- Wetlands contribute to the maintenance of water quantity and quality conditions due to their function as natural water storage reservoirs, filters and regulators of stream flow.

- Wetlands have a high educational value because of the diversity of floral and faunal species present.

- Wetlands provide a high degree of ecological diversity.

- Wetlands are diminishing rapidly as a result of successful competition from other land uses thereby making those still remaining of greater significance.

POSSIBLE EFFECTS

- Right of way clearing and construction activities may necessitate the removal of vegetative cover.

- There may be loss of habitat for a variety of floral and faunal species.

- There may be a reduction in plant species diversity.

- There may be rutting, mixing, compacting, and eroding of organic soils.

- Alteration of wetland hydrology may alter water storage capacity, downstream flow conditions, runoff volumes, and initiate erosion and/or flooding.

- Operation of construction equipment may initiate passage of contaminants into the aquatic environment, affecting plant and animal life.

- There may be temperature changes resulting from removal of the vegetative cover.

POSSIBLE MITIGATION

- Construction effects may be minimized by timing construction for frozen soil conditions.

- Minimize the use of heavy equipment in wetlands by using helicopters wherever possible.

- Selectively cut vegetative cover.

B3.4.1 FOREST RESOURCES 1

OBJECTIVE

Avoid seed production areas, experimental forest areas, and maple sugar bush operations.

DESCRIPTION

These areas represent high quality stands designated for seed production, research areas for hybrid poplar and larch experiments, and sugar maple woodlots for maple syrup production. They represent less than one percent of the study area.

RESOURCE VALUE

- Seed production areas provide important, dependable seed sources for future reforestation.

- Seed production areas consist of particular seed trees that would assure climatic adaptation or genetic superiority in a certain geographic area.

- Experimental forest areas may provide scientific and/or genetic knowledge for the improvement of future timber production.

- Sugar bushes provide cash income for local farms; average revenue estimated as $1,200/ha/year (total value was over $2 million dollars in 1980, "Agricultural Statistics for Ontario", 1981).

- Sugar bushes take a long time (50-100 years dependent upon site quality and management techniques) to become established and productive.

POSSIBLE EFFECTS

- Trees may be removed to provide space for access roads and the right of way.

- Insufficiency of seed supply may interfere with future regeneration plans.

- The loss of experimental areas for research may terminate specific studies before results and conclusions are obtained. This implies a waste of monetary investment and a retardation of forest research.

- Transmission facilities may interfere with mechanical operations of forest management activities such as site preparations or spraying.

- Construction activities may disrupt the sap collection system in a maple sugar operation.

- Opening up a stand or woodlot may expose trees adjacent to the ROW to sun scald, wind throw, and/or temperature and moisture region changes.

POSSIBLE MITIGATION

- Time construction activities to save the seed or sap harvest or experimental research of that year.

- Use the ROW for access.

- Fell trees toward the centre-line to minimize damage to adjacent woodlots or stands.

B3.4.2 FOREST RESOURCES 2

OBJECTIVE

Avoid intensively managed forest areas.

DESCRIPTION

These areas include agreement forests (under the Woodlands Improvement Act and the Forestry Act), non-agreement plantations, and other intensive forest management areas. They represent approximately 13 percent of the study area.

RESOURCE VALUE

- Agreement forests and non-agreement plantations provide a portion of the land base necessary to produce wood fibre to maintain the local forest industry.

- Agreement forests represent government efforts to improve forest yield and woodlot quality, control erosion, regulate streamflow, and manage wildlife.

- The Larose Forest represents a successfully managed forest. It is also an example of a multiple use of forest land.

- Intensively managed forest areas have potential for future wood supply from thinning operations and represent high combined investments of time, manpower, and money to increase productivity.

POSSIBLE EFFECTS

- ROW clearing may interfere with the owner's financial plan, raw material production plans, and/or forest improvement plans.

- The presence of transmission facilities and access roads will negate opportunities for timber production.

- Transmission facilities may interfere with management of the forest, and/or the operation of mechanical devices such as site preparation, spraying or harvesting adjacent to rights-of-way.

- Opening up a stand or woodlot may expose trees adjacent to the ROW to sun scald and/or temperature and moisture regime changes.

- Cutting may disrupt formal contracts (WIA and Agreement Forest) between government and individuals or public agencies.

POSSIBLE MITIGATION

- Harvested wood can be utilized, whenever possible, to reduce immediate raw material losses.

- Use the ROW for access.

B3.4.3 FOREST RESOURCES 3

OBJECTIVE

Avoid productive forest lands with valuable species from young to mature age classes.

DESCRIPTION

These forest lands consist of species such as oak, sugar maple, basswood, white ash, yellow birch, walnut, pines, spruces and fir. These lands are capable of being used for commercial timber production. They occupy approximately 2 percent of the study area.

RESOURCE VALUE

- Productive forest lands with valuable mature species provide the major supply of raw materials to support various forest industries in the area.

- Forest industries provide a major economic contribution to the area through employment.
- Productive forest lands used for timber production are limited in area due to infringement by other competing land uses.

- Immature trees provide for the future supply of large timber.

POSSIBLE EFFECTS

- Transmission ROWs and access roads take productive forest lands out of timber production.

- Clearing of ROWs and access roads may increase soil erosion and change local drainage patterns.

- Transmission facilities may interfere with forest management activities such as site preparation and spraying.

- ROWs and access roads that open forest stands may indirectly reduce soil productivity adjacent to them by changing the site conditions (soil moisture regime, temperature conditions).

POSSIBLE MITIGATION

- Same as Forest Resources 2.

B3.4.4 FOREST RESOURCES 4

OBJECTIVE

Avoid productive forest lands with intermediate value, and low value species from young to mature age classes.

DESCRIPTION

These areas consist of mature, immature, young, and all-aged stands of intermediate value species (such as poplar, white birch, elm, soft maple, tamarack, hemlock, and cedar, and low value species such as alder, ironwood, etc.), and are currently used for commercial timber production. They occupy approximately 16 percent of the study area.

RESOURCE VALUE

- Productive forest lands with all-age intermediate and low value species provide a supply of raw material to support various forest industries in the area, including pulp and paper plants.

- Productive forest lands used for timber production are limited in area due to infringement by competing land uses.

- Mature trees and all-aged classes provide large size timbers and, therefore, have immediate market value.

- Immature and young trees provide for the future supply of large size timber.

POSSIBLE EFFECTS

- Same as Forest Resources 3.

- ROW clearing may interrupt the short-term or long-term supply of intermediate value species.

POSSIBLE MITIGATION

- Same as Forest Resources 2.

B3.5.1 HERITAGE RESOURCES 1

OBJECTIVE

Avoid confirmed archaeological sites and known historical sites.

DESCRIPTION

These sites have been confirmed by the Ministry of Citizenship and Culture, the Ministry of Natural Resources, or Parks Canada, as being archaeologically and/or historically significant. They include locations of various archaeological finds and historic settlements. They occupy less than 1 percent of the study area.

RESOURCE VALUE

- These areas provide opportunities for gaining insight into our cultural heritage.

- Identified sites may be of national, provincial or local significance.

- Some identified sites may, as yet, still require a detailed investigation by professional archaeologists and historians to reveal the full heritage/historical record.

- These identified areas represent an investment on the part of Ministry of Citizenship and Culture and others.

- These sites are protected under the Ontario Heritage Act (1974).

POSSIBLE EFFECTS

- Transmission lines located on confirmed archaeological sites may conflict with provincial heritage planning policies.

- The character of the surrounding landscape may be an integral part of a historical or archaeological site. Hydro transmission facilities may alter this character, and may be considered incompatible because:

    - the presence of towers, guys and conductors may alter perception of scale relationships between transmission facilities and natural elements, and interfere with views to points or features of interest.

    - the clearing associated with construction of transmission facilities may alter colour contrasts between the right of way and adjacent vegetation (particularly in winter), create sharp edges that are out of character with natural vegetation patterns, and create long views along, or from the right of way.

- Soil compaction and excavation associated with construction activities may disturb a site or destroy artifacts.

- The right of way and access roads create new and uncontrolled access to sites.

POSSIBLE MITIGATION

- Minimize disturbance to sites by consulting with Ministry of Citizenship and Culture prior to construction.

- Control access to the right of way or roads by limiting the number of new access roads and number of roads maintained after construction.

- Minimize visibility of the transmission facilities by applying selective cutting practices and strategically locating new access roads.

- It may be necessary to remove and/or relocate historic buildings from the transmission right of way if possible.

- Prior to removal of building (if necessary) fully document and photograph the resource.

B3.5.2 HERITAGE RESOURCES 2

OBJECTIVE

Avoid reported but unsubstantiated archaeological sites, and areas having archaeological potential.

DESCRIPTION

The reported but unsubstantiated archaeological sites were reported to the Ministry of Citizenship and Culture as a result of the discovery of artifacts by individuals. Areas having archaeological potential were identified by correlating existing landform characteristics with established cultural characteristics of the early native peoples. This situation occupies approximately 12 percent of the study area.

RESOURCE VALUE

- These areas may provide valuable archaeological information.

- These areas may be of national, provincial or local significance.

- These areas are generally associated with lake and river systems, post-glacial shorelines, and landforms commanding a view of valleys or lakes.

POSSIBLE EFFECTS

- The character of the surrounding landscape may be an integral part of an archaeological site. Hydro transmission facilities may alter this character, and may be considered incompatible because:

    - the presence of towers, guys and conductors may alter the perception of scale relationships between transmission facilities and natural elements, and interfere with views to points or features of interest.

    - the clearing associated with construction of transmission facilities may alter colour contrasts between the ROW and adjacent vegetation (particularly in winter), create sharp edges that are out of character with natural vegetation patterns, and create long views along or from the right of way.

- Soil compaction and excavation associated with construction activities may accidently alter or destroy artifacts and associated sites; permanent change.

- Professional archaeologists may occupy work areas during construction for exploratory excavation of newly discovered sites; temporary change.

- The right of way and access roads may create new and uncontrolled access to potential or newly discovered sites; long-term and temporary change.

POSSIBLE MITIGATION

- Ontario Hydro, in consultation with the Ministry of Citizenship and Culture, may determine appropriate measures to document and/or remove the resources.

- An archaeological survey may be undertaken by a professional archaeologist to establish the significance of reported but unsubstantiated archaeological sites, and the actual existence of the identified potential sites, in order to establish the mitigation required.

- Upon verification of an archaeological site, mitigation measures may be implemented to:

  - minimize disturbance to sites by consulting with Ministry of Citizenship and Culture prior to construction.

  - control access to the ROW or roads by limiting the number of new access roads and number of roads maintained after construction.

B3.5.3 HERITAGE RESOURCES 3

OBJECTIVE

Avoid historically representative cultural landscapes that exemplify settlement patterns or land use practices.

DESCRIPTION

The cultural landscapes represent the variety of land use practices found in the study area. Within each of the landscapes, areas of potential historical significance such as railways, settlement roads, villages with early inns or post offices have been identified to exemplify the historic development of these areas. The remaining sites or buildings may still evoke a local historical influence. This situation occupies approximately 18 percent of the study area.

RESOURCE VALUE

- These landscapes provide a visual record of the history of local communities, and the region. They also represent a cultural tie to earlier periods.

- These landscapes are moderately sensitive to visual changes and highly sensitive to the removal of potential historic structures.

POSSIBLE EFFECTS

- The location of transmission facilities may necessitate the removal and/or loss of structures of potential historic significance. This may indirectly alter the perception of the cultural landscape.

- The removal of hedgerows and woodlots that define field patterns may alter the perception of the cultural landscape.

- The direct effect of removing existing structures would be high, while the visual changes to the appearance of the landscape would be moderate.

- All effects would be long term.

- The removal of structures and vegetation would be limited to the right of way.

POSSIBLE MITIGATION

- Potentially historic structures may be saved by moving them to another site.

- Minimize disturbance to buildings of potential historic significance by consulting with Ministry of Citizenship and Culture prior to construction.

B3.6.1 HUMAN SETTLEMENT 1

OBJECTIVE

Avoid existing urban settlements.

DESCRIPTION

This situation includes cities, towns and villages which have a defined urban form such as primary, secondary and/or tertiary industry; community services such as sewers, watermains. This situation occupies approximately one percent of the study area.

RESOURCE VALUE

- The existing built up areas represent economic and social investments on the part of the owners and/or the communities.

- There may be historical/emotional attachments to the areas as a result of the age of the development.

- They may provide a setting for a wide range of community activities for the residents as well as for the people in the surrounding areas.

- There may be a scarcity of suitable replacement lands with associated services such as sewer and water.

POSSIBLE EFFECTS

- Existing structures may be permanently removed.

- During the construction phase, noise, dust, and other inconveniences may result for short periods of time.

- There may be social, economic, and psychological effects caused by the dislocation of households, residents and businesses.

- Transmission facilities may conflict with officially stated and/or approved land use policies. A long term disruption to existing land use pattern and associated activities may result. There may also be long term effects on future land use patterns and developments.

- Transmission facilities may alter the visual character of neighbourhoods.

- The direct effects would be limited to the properties acquired for the right of way. The indirect effects to adjacent properties during construction would be short term.

POSSIBLE MITIGATION

- It may be possible to minimize interference with existing land use patterns by following linear severances such as railways, roads, existing utility rights-of-way, and other linked open space systems within urban areas.

- It may be possible to minimize visual intrusion by planting compatible vegetative screens and applying selective cutting practices.

B3.6.2 HUMAN SETTLEMENT 2

OBJECTIVE

Avoid existing strip developments.

DESCRIPTION

These concentrations include numerous small crossroad developments, and strip developments along county roads and roads leading into urban areas. They may include commercial or other facilities too small to be designated by the institutional/commercial/industrial objective. This situtation occupies approximately one percent of the study area.

RESOURCE VALUE

- The existing built-up areas represent economic and social investments on the part of the owners and/or the communities.

- There are historical/emotional attachments to the areas as a result of the age of the developments.

- They may provide a setting for a wide range of activities for the residents, as well as for the people in the surrounding area.

POSSIBLE EFFECTS

- Same as Human Settlement 1.

POSSIBLE MITIGATION

- Same as Human Settlement 1.

B3.6.3 HUMAN SETTLEMENT 3

OBJECTIVE

Avoid existing non-urban institutional, commercial and industrial facilities, including existing licensed and/or approved airports, airfields and communication tower fields.

DESCRIPTION

This situation includes all government facilities, such as Department of National Defence bases, communication tower fields, research facilities, correctional centres, industrial developments, and dumps and sewage lagoons.

All airports are considered which have ground facilities such as hangars, fuel storage and parking. Airstrips without ground facilities are not included at this stage of study.

These sites are generally quite small and localized. There are, however, numerous facilities in the immediate vicinity of Ottawa.

This situation occupies approximately one percent of the study area.

RESOURCE VALUE

- The existing facilities represent economic and social investments on the part of the owners and/or the communities.

- In many instances, these facilities provide employment and other benefits to the local and/or regional areas.

- In some cases, it may be the only facility providing specific services to the public and, thus, would be more valuable because of its scarcity.

- Some of these facilities are location-oriented and/or depend on local infrastructure and, thus, would be sensitive to relocation.

POSSIBLE EFFECTS

- Existing structures or facilities may be removed. People owning or employed in the service industry may be displaced. Activities associated with the present use (such as interference with airplane traffic approaching air fields) may be disrupted.

- Transmission facilities may conflict with officially stated and/or approved land use policies. The Department of Transport has licencing requirements that limit the height of structures within the vicinity of airports in order to ensure flight safety.

- Transmission facilities may conflict with officially stated and/or approved land use policies.

- Signals to and from certain communication towers may be altered by the presence of transmission line structures.

- Unless suitable replacement sites were found, the intensity of the change would be high. The duration would depend on the length of time necessary to develop an alternate site. In some instances, the change would be permanent.

POSSIBLE MITIGATION

- Same as Human Settlement 1.

B3.6.4 HUMAN SETTLEMENT 4

OBJECTIVE

Avoid areas of approved residential development.

DESCRIPTION

This situation includes areas which have been approved by the Ministry of Housing for development. They may or may not have any services (eg. sewers, water, streets) already developed, and they may or may not be registered or surveyed. These areas may be estate residential (usually up to 5 hectares in size), or normal building lots (approximately 750 square metres).

This situation occupies approximately one percent of the study area.

RESOURCE VALUE

- The land has a higher economic value since it is severed and has met all approvals for development. If services are present, it has an even higher economic value since the developer has spent additional monies on the lots.

POSSIBLE EFFECTS

- Transmission facilities may hinder the planned development of the land and may reduce the number of available lots as designated.

- Lines may create a barrier to expansion and new development.

- Transmission facilities may conflict with the aesthetics of the development.

- The presence of lines may increase servicing costs such as increased sewer and water costs per lot.

- They may disrupt the planning of other agencies such as altered lay out designs for sub-divisions.

- Most of the potential changes will be permanent and of a high intensity.

- The direct effects will be limited to the properties acquired.

- There is a potential for these areas to be developed prior to the construction of the line as a result of the long approval and acquisition process. Adjacent property owners may not be aware of, or prepared for, the construction of the line.

POSSIBLE MITIGATION

- Same as Human Settlement 1.

B3.7.1 MINERAL RESOURCES 1

OBJECTIVE

Avoid active pits and quarries.

DESCRIPTION

This situation includes licensed and unlicensed pits and quarries. They may be on Crown or private land, and include both the active area of the pit and the licensed reserve which will be exploited during the lifespan of the operation.

This situation does not include wayside pits or borrow pits. It occupies approximately 2.5 percent of the study area.

RESOURCE VALUE

- The pit or quarry represents an economic investment on the part of the owner.

- Sand and gravel deposits are limited, non-renewable, natural resources.

- Pits and quarries represent the most widespread mining activity in the study area.

- The aggregate industry is a significant contributor to the local economy.

POSSIBLE EFFECTS

- Transmission facilities may conflict with officially designated areas for active and planned extraction operations.

- An increase in marketing costs may result due to interference with vehicular traffic and machinery.

- Hydro facilities may put increased pressure on existing reserves that are of limited supply by restricting extraction of the resource below tower bases.

- A long term restriction on exploitation of a limited, non-renewable, natural resource may result in a loss of economic potential.

- There may be social and economic effects caused by the dislocation of businesses and jobs.

POSSIBLE MITIGATION

- Where possible, remove the resource prior to tower construction in pits and quarries.

- Maximize clearance of conductors to minimize interference with mining equipment.

- Increase tower span to avoid locating towers in active pits or quarries.

B3.7.2 MINERAL RESOURCES 2

OBJECTIVE

Avoid areas of high sand and gravel reserve potential.

DESCRIPTION

This situation includes reserves of high sand and gravel potential which have been identified by the Ministry of Natural Resources. It occupies approximately one percent of the study area.

RESOURCE VALUE

- Aggregate reserves are limited, non-renewable natural resources.

- Future demand for aggregate will remain high for a variety of construction uses.

- Aggregate can only be economically transported over relatively short distances and, thus, reserves in areas such as the Shield, where industrial minerals are not common, become more valuable.

POSSIBLE EFFECTS

- Transmission facilities may interefere with planned operations and future uses of aggregates.

- There may be long term restrictions on the volume of future aggregate available for extraction.

- Higher costs for unaffected aggregate reserves may result since their relative scarcity will make them more valuable.

POSSIBLE MITIGATION

- Minimize the portion of the reserve deposit occupied by tower bases.

B3.7.3 MINERAL RESOURCES 3

OBJECTIVE

Avoid geologic sites and features which have recognized scientific or educational value.

DESCRIPTION

Some geologic sites and features (such as glacial spillways, marine beaches, glacial structures, varved clay deposits, fossils, unique bedrock formations, moderately sensitive clay formations, etc.) have been identified by MNR as having some measure of uniqueness, deemed worthy of recognition and preservation.

The resources are, for the most part, small scale, relatively scarce, and scattered randomly throughout, occupying approximately 4.7 percent of the study area.

RESOURCE VALUE

- The resources have been recognized as possessing relative degrees of regional scientific or educational value.

- Some features are site specific and can be compatible with a transmission right of way, but are sensitive to disturbance should they be affected by a transmission tower.

POSSIBLE EFFECTS

- Direct effects on the geologic sites may range from low to high, depending upon the size of feature and the proposed tower location.

- Direct effects on geologic features may be moderate, but transmission facilities may protect the features from competing land uses.

- The effects may, in most cases, be confined to the right of way.

POSSIBLE MITIGATION

- Avoid tower locations on the site specific geologic features.

- Survey the ROW prior to construction to identify precise locations of these features and avoid or protect these sites during construction.

- Some features encountered could be preserved from competing land uses by the right of way.

B3.8.1 RECREATION RESOURCES 1

OBJECTIVE

Avoid conservation areas.

DESCRIPTION

This situation includes federally or provincially managed conservation authority recreation parks. It occupies less than one percent of the study area.

RESOURCE VALUE

- These conservation area parks provide recreational opportunities and experiences, and protect provincially significant natural, cultural and recreational features that are close to the large population centres of eastern Ontario.

- These parks are protected by federal or provincial policies.

- These parks are intensively utilized and contribute to the regional and local economies.

POSSIBLE EFFECTS

- Tower lines are incompatible with the natural environment concepts associated with conservation areas. Recreational experiences may be altered through changes in the appearance of the landscape resulting from cresting, the removal of vegetation, and the presence of the towers.

- New transmission lines through these areas will conflict with the policies of the regulatory agencies.

- There may be a loss of facilities (i.e. campsites, buildings, etc.).

- There may be a loss of resources upon which certain recreational activities depend, particularly interpretive programs.

- Transmission lines may interfere with, or inhibit, activities by forming artifical barriers. As a result, there may be a loss of development potential.

- The loss of existing facilities, resources, and future development potential are localized effects. The remainder of the changes noted may be experienced off the right of way.

POSSIBLE MITIGATION

- The contrast between the cleared right of way and forested areas can be reversed, to some degree, by allowing the regeneration of compatible plant species on the right of way.

- Depending on site conditions, many of the losses of facilities can be reversed by providing replacement facilities.

B3.8.2 RECREATION RESOURCES 2

OBJECTIVE

Avoid existing private, commercial, and public recreation facilities.

DESCRIPTION

This situation includes private parks, campgrounds, golf courses, and municipal parks. These resources are generally activity or user oriented. This situation occupies less than one percent of the study area.

These sites are generally small and scattered across the study area.

RESOURCE VALUE

- The recreation industry constitutes a significant proportion of the economy of eastern Ontario.

- The existing private, commercial, and public recreation facilities represent economic investments on the part of the owners.

POSSIBLE EFFECTS

- These resources are sensitive to direct physical disruption. The intensity of the changes would be high and of a long duration. Changes to the appearance of the landscape would not be as severe.

- There may be a loss of facilities (i.e. campsites, buildings, etc.).

- There may be a loss of development potential.

- Interference with activities can result from the physical restriction of activities by the line or by the reduction of the perceived quality of the recreational experience.

- The occurrence of these effects would be limited to the on site changes caused by construction activities.

POSSIBLE MITIGATION

- Selective clearing and planting of compatible vegetative screens could reduce the visibility of the towers from selected viewpoints.

B3.9.1 ENGINEERING/COST CONSTRAINT 1

OBJECTIVE

Avoid sensitive/unique geologic features or soils which pose engineering restrictions to transmission line development.

DESCRIPTION

This situation includes sensitive geologic sites and features such as landslide areas, and highly unstable leda clay areas, which may pose stability problems to Hydro facilities. It occupies approximately 1.6 percent of the study area.

Sensitive landslide areas and highly unstable leda clay areas are commonly associated with the many river systems which cross the St. Lawrence and Ottawa Valley Lowlands. These areas are subject to rapid mass movements initiated either through natural processes or the activities of man. These features restrict the location and construction of transmission lines.

RESOURCE VALUE

- All sites and features are recognized as possessing unique regional scientific or educational value. Many of these sites are recommended for protection and preservation by MNR.

- Although some features are site specific, all features are highly sensitive to disturbance.

POSSIBLE EFFECTS

- Direct effects on the geologic features would range from low to high, depending upon the type of feature affected, the future tower location, and the construction practices to be followed.

- Disturbance of leda clays could result in landsliding on and off the right of way, resulting in permanent change in the landscape.

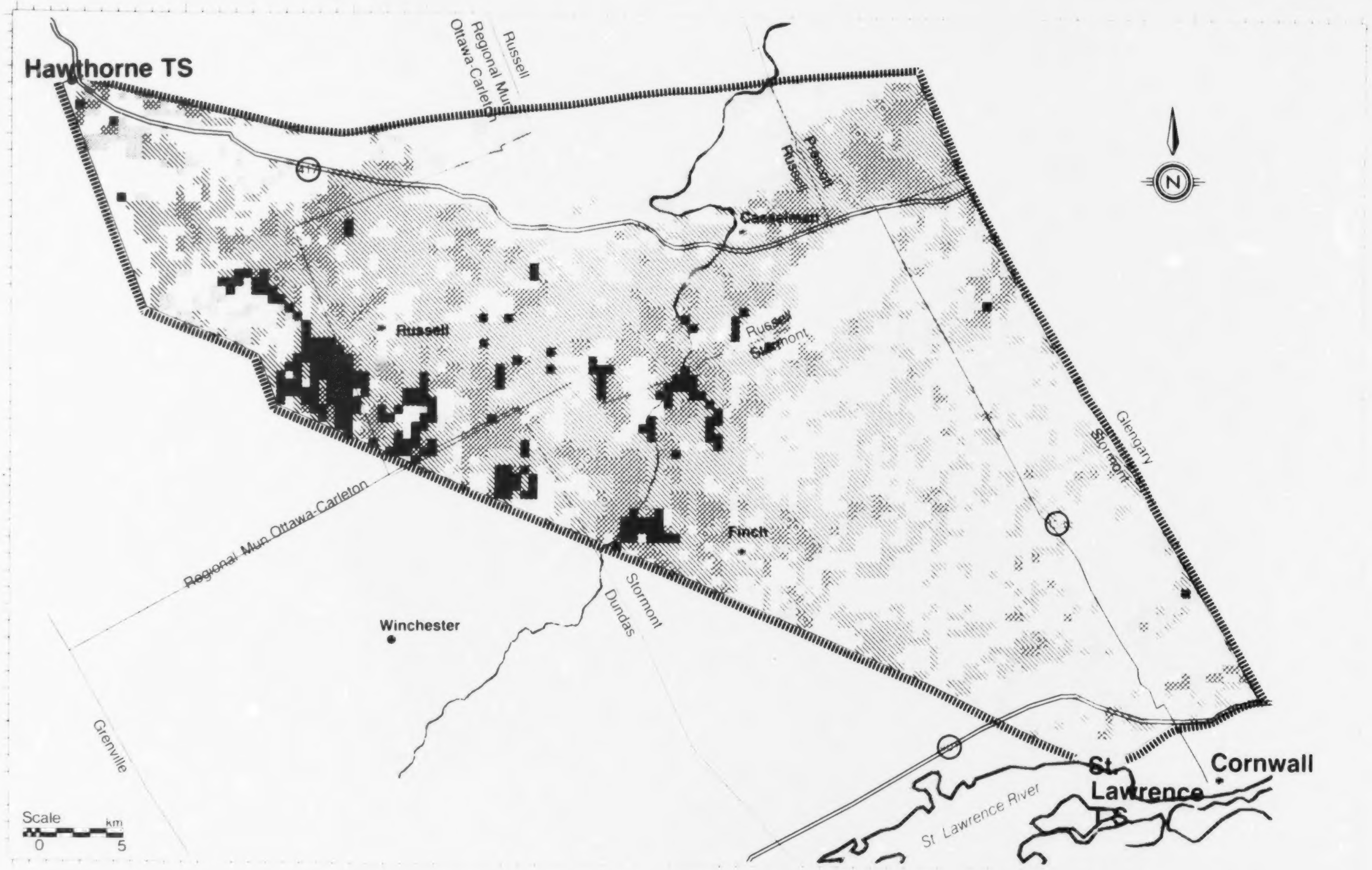
- The effect of construction activities on the site specific karst features could be of a high intensity (possible destroying of the resources).

POSSIBLE MITIGATION

- Survey the ROW prior to construction to identify precise locations of these features and avoid or protect these sites during construction.

APPENDIX B.4

FACTOR MAPS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Agricultural Resources – EREAR

Legend

- ▮▮▮▮▮▮▮ Study Area Boundary
- **TS** Transformer Station
- ■ Specialty crop production areas and CLI soil capability class 1 in agriculture
- ▩ CLI soil capability classes 2, 3 in agriculture with drains
- ▨ CLI soil capability classes 2, 3 in agriculture without drains
- CLI soil capability classes 4 in agriculture

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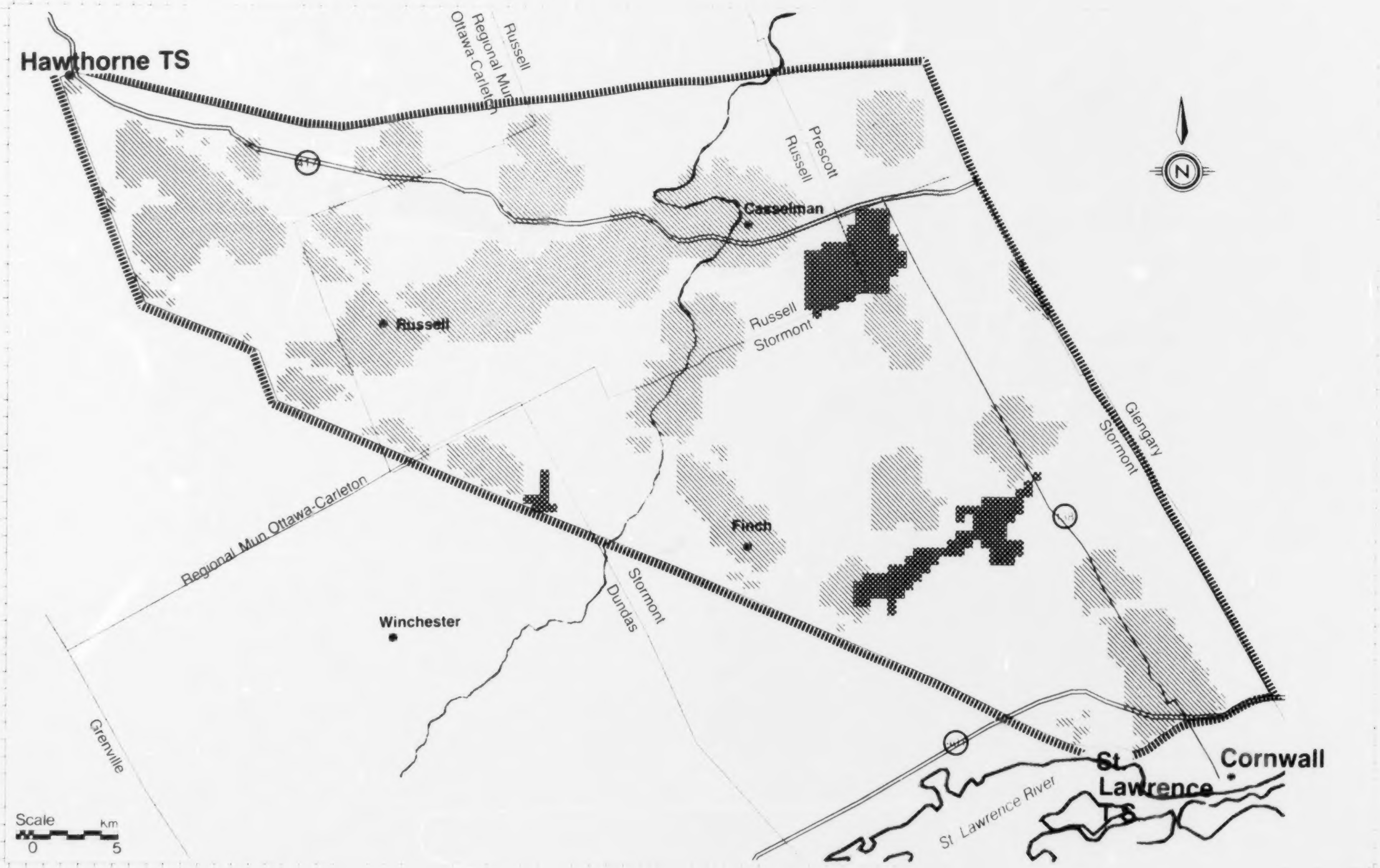
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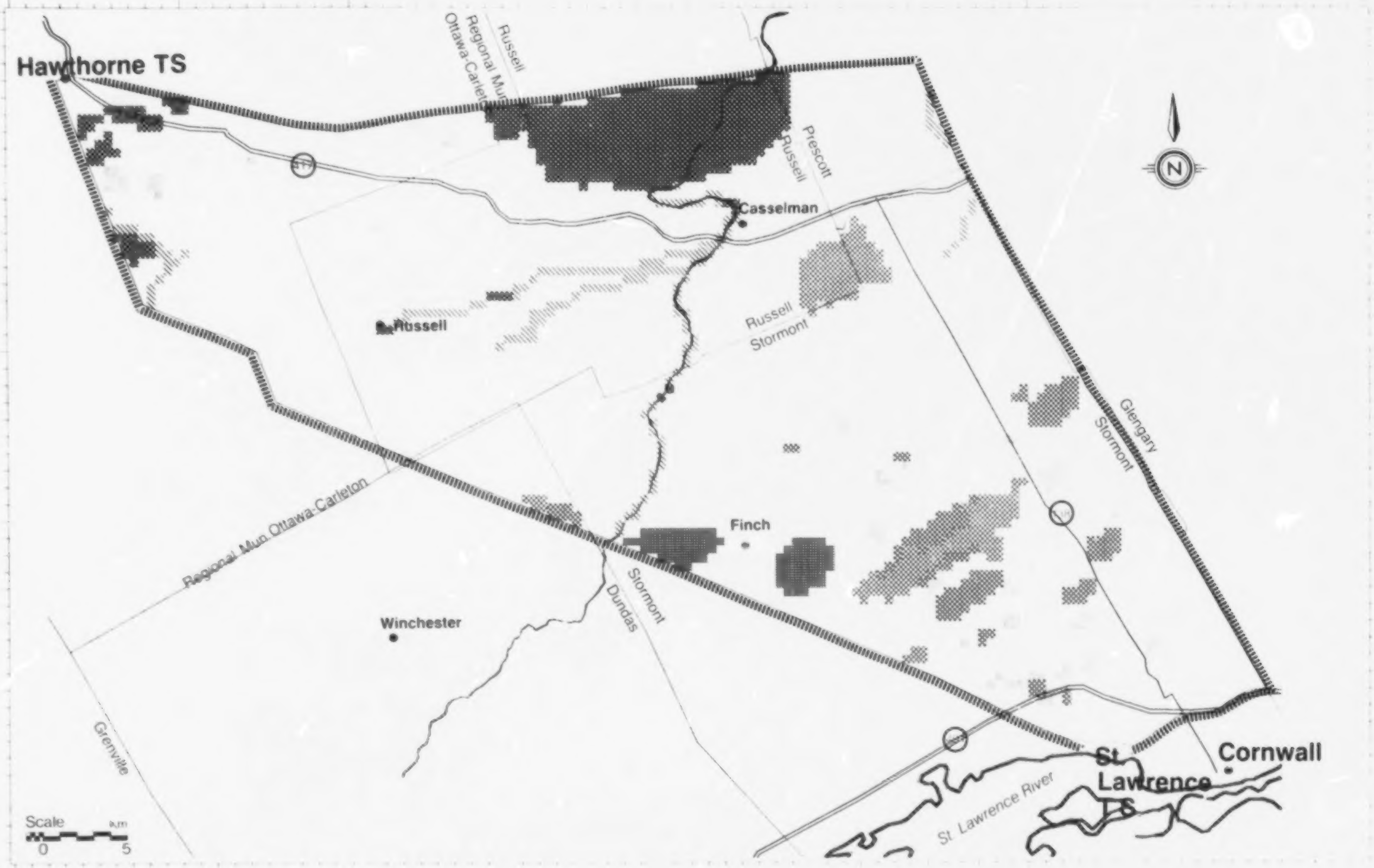
Appearance of the Landscape – EREAL

Legend

- ▮▮▮▮▮▮ Study Area Boundary
- **TS** Transformer Station
- ▨ Viewsheds of existing settlements
- ▩ Landscapes that are characterized as natural
- ░ Viewsheds of highways in flat, untreed landscapes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Biological Resources – EREBR

▮▮▮▮▮▮	Study Area Boundary	▩	Deer winter concentration areas
TS	Transformer Station	▦	Waterfowl habitat
■	Rare/unique biological areas	▨	Cold and warm water fisheries
▩	Biologically sensitive wetlands	░	Wetlands with no identified biological significance

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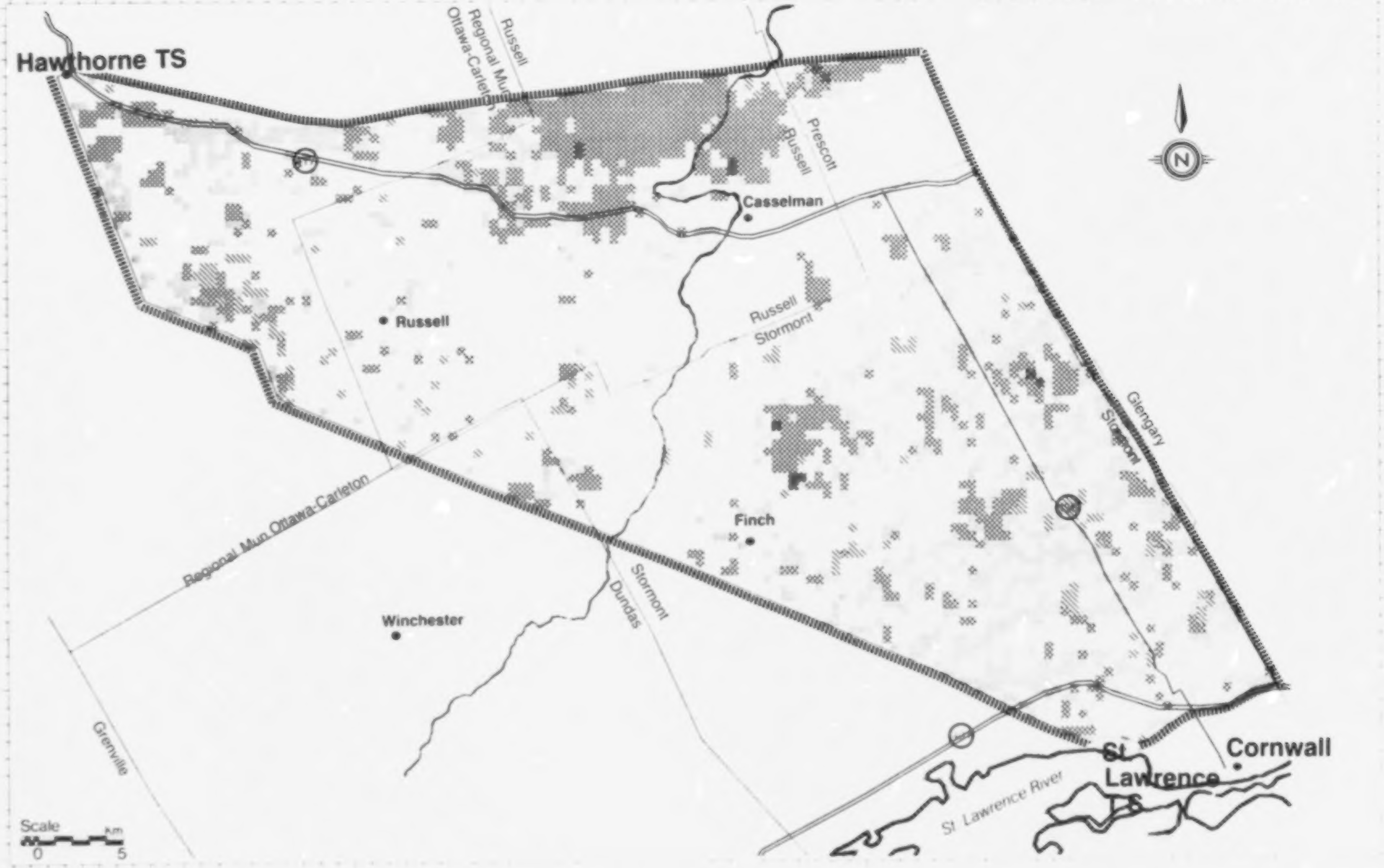
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Forest Resources – EREFR

Legend

▦	Study Area Boundary
TS	Transformer Station
■	Seed production areas, experimental forest areas, maple sugar operations
▩	Intensively managed forest areas
▨	Valuable species – young to mature forests
░	Intermediate to low value – young to mature forests

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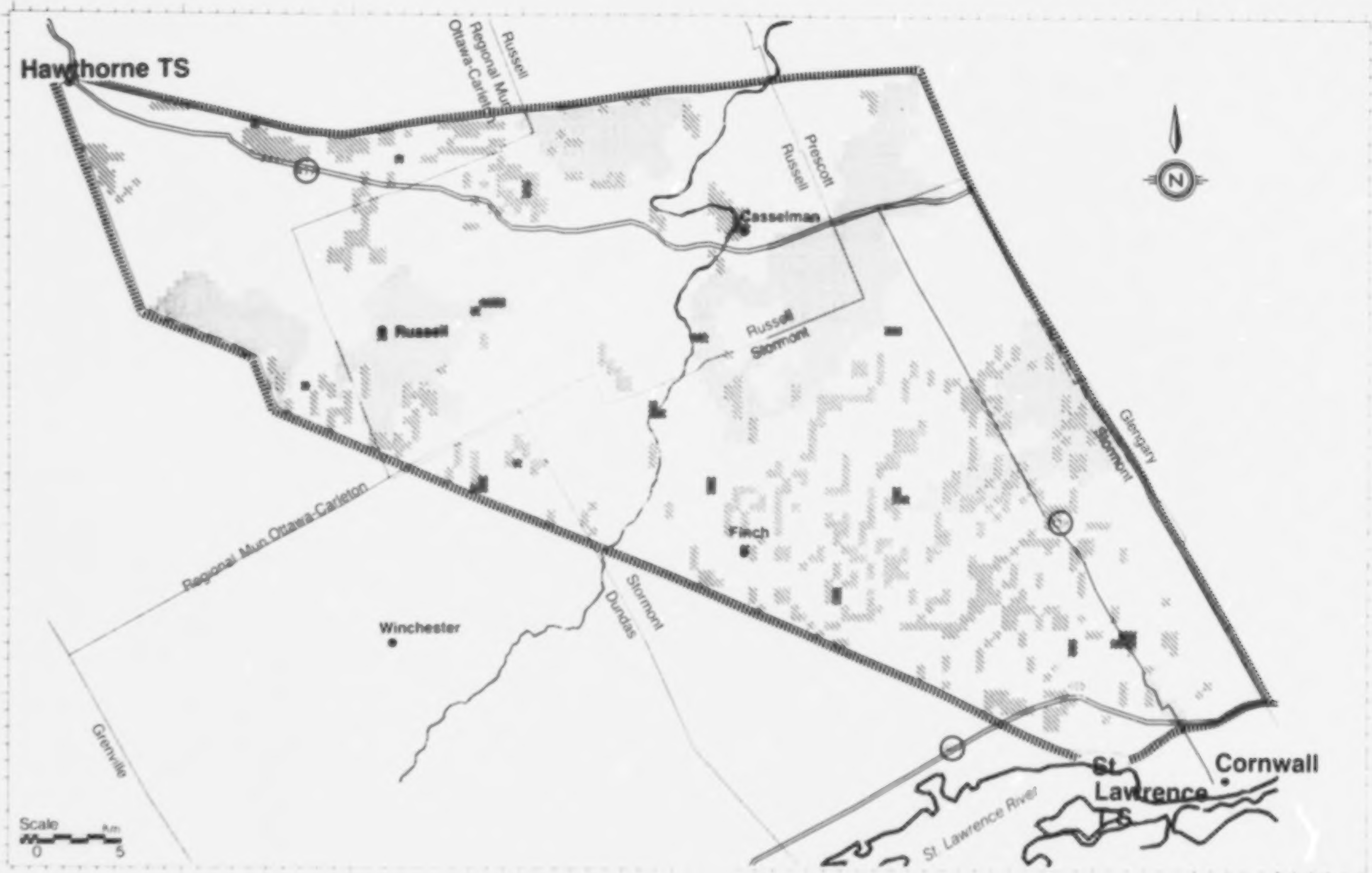
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Heritage Resources – EREHR

Legend

- ▨ Study Area Boundary
- TS Transformer Station
- ■ Confirmed archaeological/known historical sites
- ▨ Potential archaeological sites and areas
- ░ Historically representative cultural landscapes

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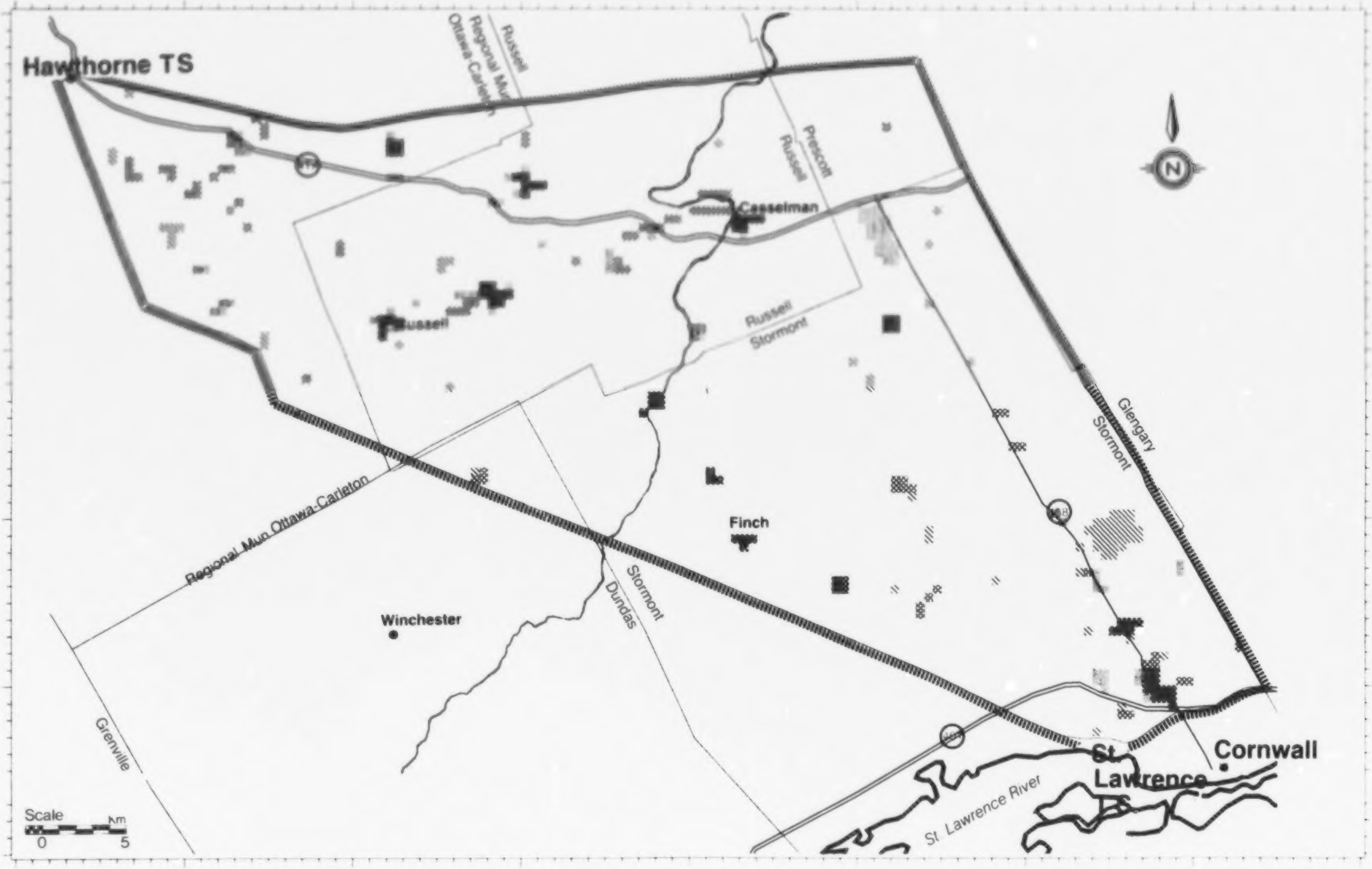
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St Lawrence River
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Human Settlement – EREHS

Legend

▥	Study Area Boundary
TS	Transformer Station
■	Existing urban settlements
▩	Existing strip developments
▨	Existing institutional, commercial and industrial
░	Approved residential developments

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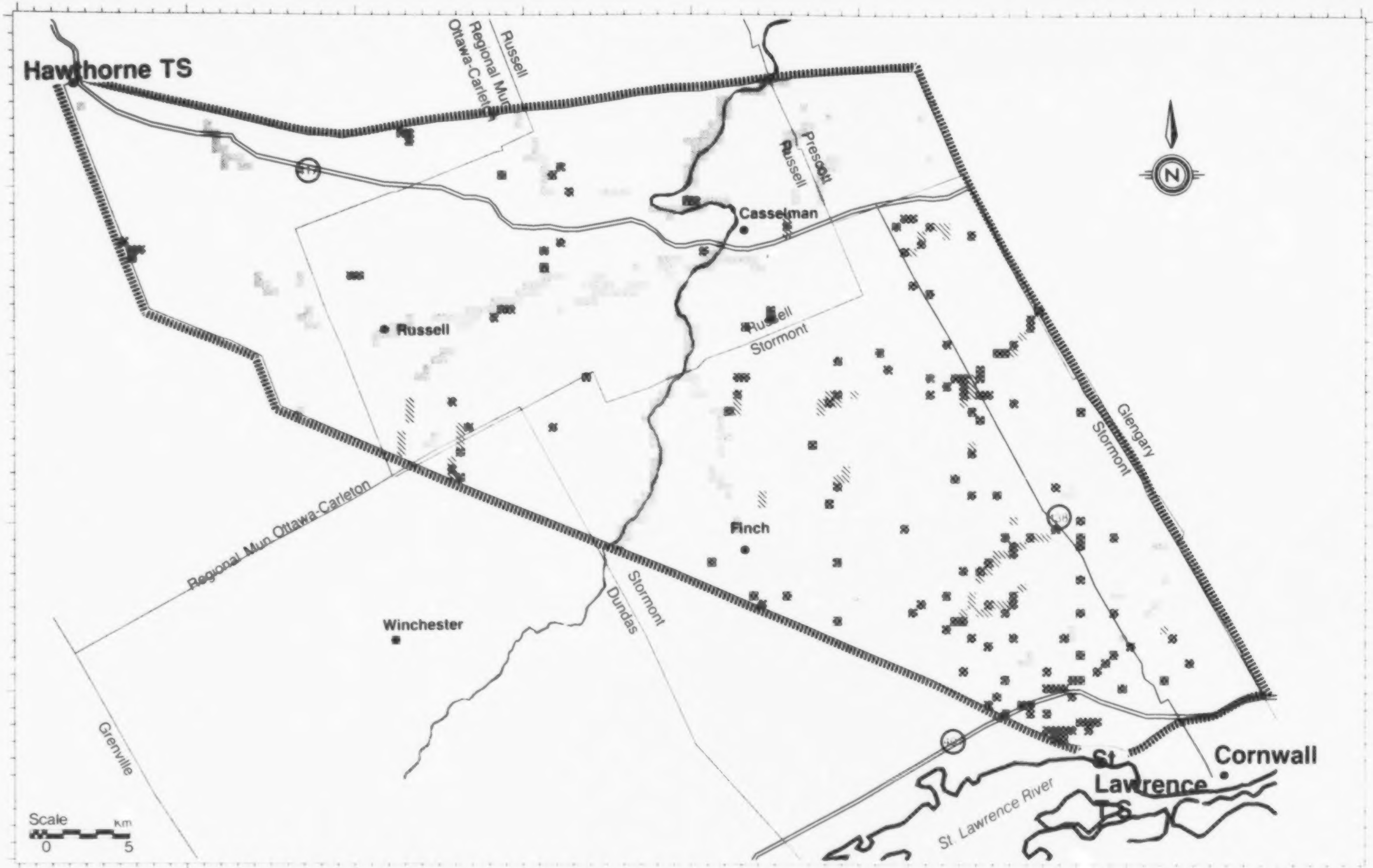
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Dundas
Winchester
Grenville
Cornwall
St Lawrence TS
St. Lawrence River
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Scale
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5

Mineral Resources – EREMR

Legend

▮▮▮▮▮▮	Study Area Boundary
TS	Transformer Station
■	Active pits and quarries
▨	Areas of high sand and gravel reserve potential
░	Geologic sites and features with known value

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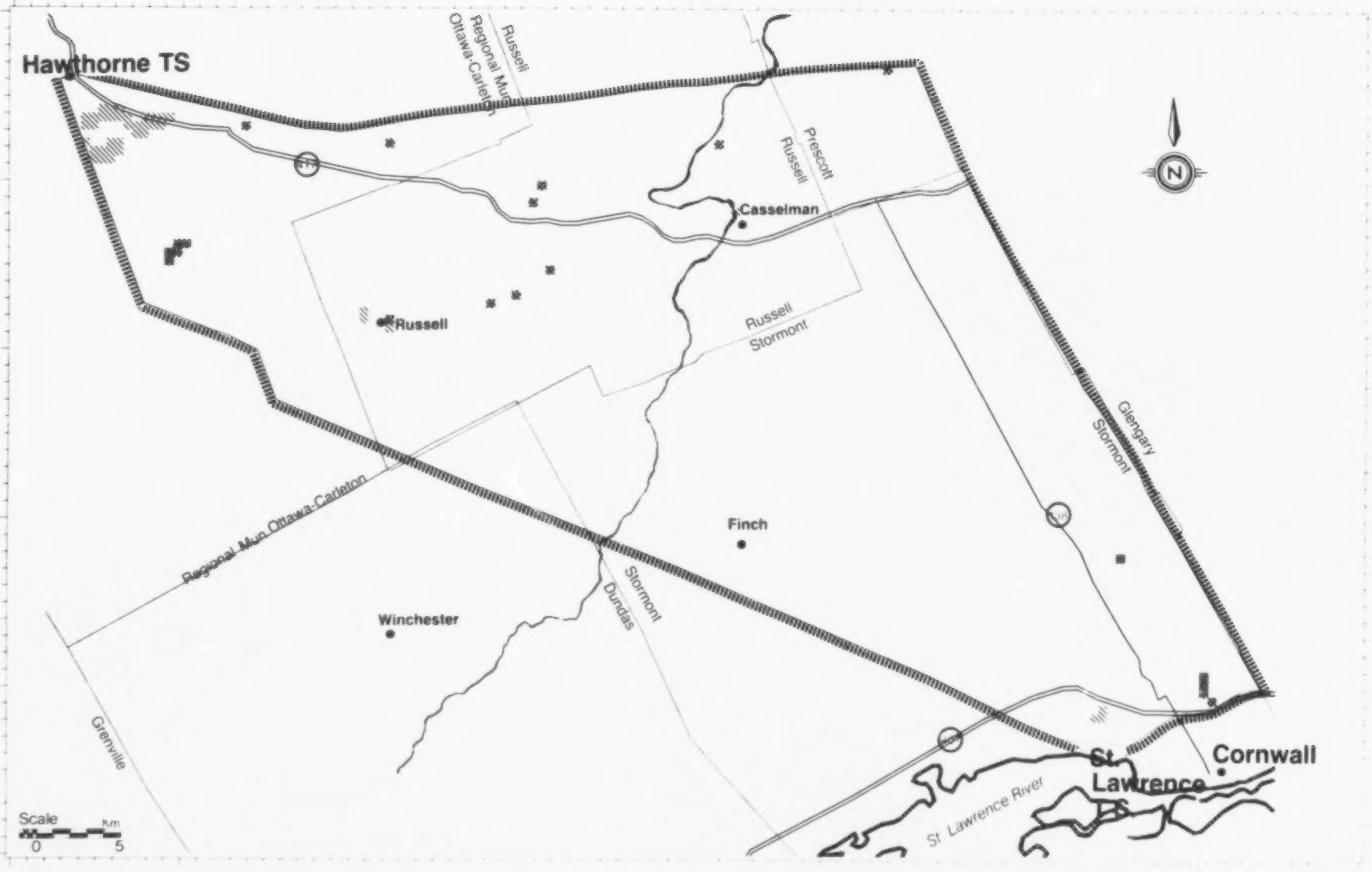
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Finch
Winchester
Regional Mun Ottawa-Carleton
Stormont
Dundas
Grenville
St. Lawrence
Cornwall
St Lawrence River
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Recreation Resources – ERERR

Legend

▥ Study Area Boundary

TS Transformer Station

■ Existing private/commercial/public facilities

▨ Conservation areas

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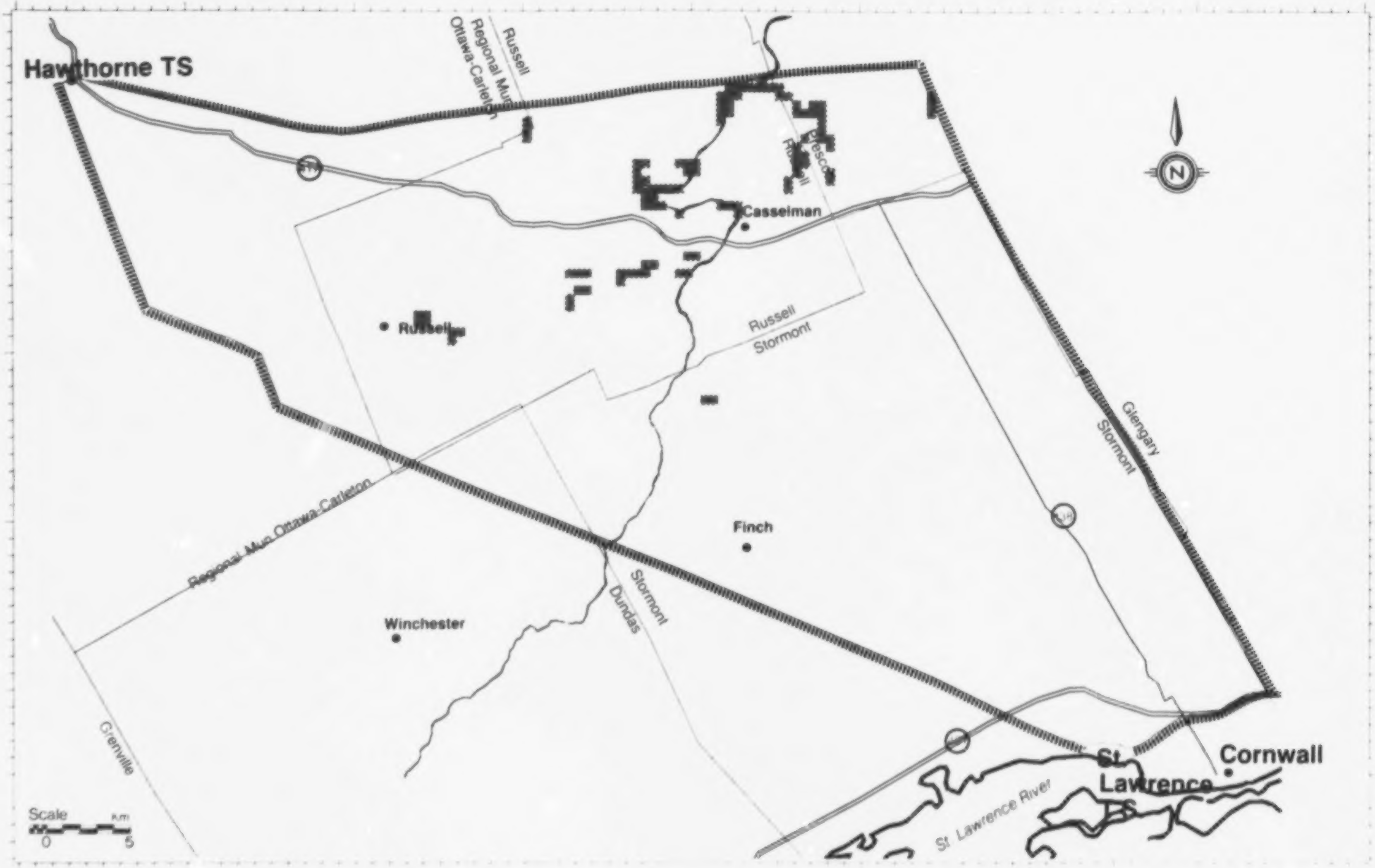
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Regional Mun Ottawa-Carleton
Stormont
Dundas
Winchester
Grenville
Cornwall
St. Lawrence TS
St. Lawrence River
Scale
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Engineering/Cost Constraints – EREEC

Legend

▥ Study Area Boundary

TS Transformer Station

▇ Sensitive/unique geologic features

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APPENDIX B.5

OBJECTIVE RATING CRITERIA

B.5 OBJECTIVE RATING CRITERIA

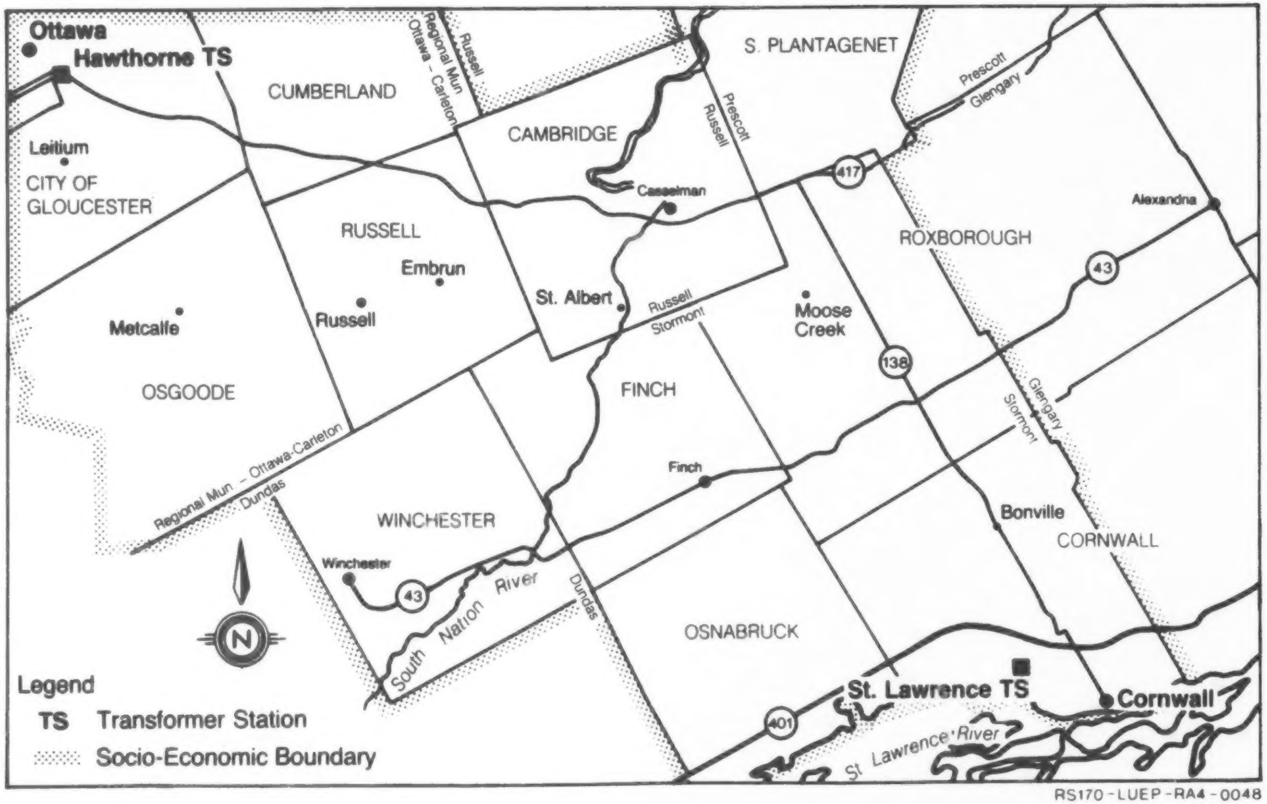
Possible Effects	Resource Value
1. Low	1. Low
- minimal direct effect, no indirect effect - localized extent of effect - short duration of effect - low intensity of effect - "Construction and Site Restoration Guidelines" capable of mitigating effects on site	- low relative resource importance - high resource occurrence - low sensitivity of resource to change - low probability of land use affection or resource depletion
2. Moderately Low	2. Moderately Low
- moderate direct effect, no indirect effect - moderate intensity of effect - localized extent of effect - short duration of effect - low frequency of effect - "Construction and Site Restoration Guidelines" capable of mitigating effects on-site - "Construction and Site Restoration Guidelines" capable of mitigating effects on-site	- moderate relative resource importance - random resource occurrence - moderate sensitivity of resource to change - low probability of land use affection or resource depletion
3. Moderate	3. Moderate
- moderate direct effect, low indirect effect - moderate intensity of effect - localized extent of effect - intermediate duration of effect - moderate frequency of effect - remedial measures available on-site	- moderate relative resource importance - selective or site specific occurrence - moderate sensitivity of resource to change - moderate probability of land use affection or resource depletion
4. Moderately High	4. Moderately High
- high direct effect, moderate to high indirect effect - moderate intensity of effect - intermediate duration of effect	- high relative resource importance - selective or site specific occurrence

- high frequency of effect - few remedial measures available or irreversible effect	- high sensitivity of resource to change - high probability of land use affection or resource depletion
5. High	5. High
- high direct effect, moderate to high indirect effect - high intensity of effect - long duration of effect - high frequency of effect - few remedial measures available or irreversible effect	- high relative resource importance - rare/unique resource or site specific occurrence - high sensitivity of resource to change - high probability of extensive land use affection or resource extinction

APPENDIX B.6

SOCIO-ECONOMIC DATA

Appendix B6.1 Socio-Economic Study Area


Ottawa
Hawthorne TS
CUMBERLAND
Regional Mun
Ottawa - Carleton
Russell
S. PLANTAGENET
Prescott
Russell
Prescott
Glengary
Leitium
CITY OF
GLOUCESTER
CAMBRIDGE
Casselman
417
RUSSELL
Embrun
Russell
ROXBOROUGH
Alexandria
43
Metcalfe
St. Albert
Russell
Stormont
Moose
Creek
138
OSGOODE
FINCH
Glengary
Stormont
Regional Mun. - Ottawa-Carleton
Dundas
Finch
WINCHESTER
Winchester
43
South Nation River
Dundas
Bonville
CORNWALL
OSNABRUCK
St. Lawrence TS
Cornwall
401
St. Lawrence River
Legend
TS Transformer Station
Socio-Economic Boundary

RS170 - LUEP - RA4 - 0048
RS-170-LUEP-RA6-0050

B6.2 SOCIO-ECONOMIC BIBLIOGRAHY

Data Sources

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APPENDIX B6.3

SOCIO-ECONOMIC DATA

TABLE B6.3.1

Population Change of Townships in Eastern Ontario Route Stage - East Study Area, 1971-1981

Townships	Total Population			Population Change	
	1971	1976	1981	1976-1981	1971-1976
Gloucester	36,940	56,516	72,859	+29%	+53%
Cumberland	9,166	12,377	16,177	+31%	+35%
Osgoode	7,797	8,957	9,360	+4%	+15%
Russell	4,059	4,937	5,773	+17%	+22%
Cambridge	2,361	3,664	4,485	+22%	+55%
Winchester	2,780	3,017	3,010	-.2%	+9%
Finch	2,233	2,284	2,280	-.1%	+2%
Roxborough	2,916	3,010	3,035	+.8%	+3%
S. Plantagenet	1,797	1,708	1,586	-7%	-2%
Osnabruck	3,331	3,871	4,230	+9%	+16%
Cornwall	4,502	4,806	5,175	+7%	+7%
Province of Ontario	7,703,100	8,264,400	8,625,000	+4%	+7%

Source: Statistics Canada. 1981. Selected population, dwelling, household and census family characteristics, for Census Divisions and Subdivision.

Ontario Department of Municipal Affairs. 1972. 1972 Municipal Directory.

TABLE B6.3.2

Population Distribution - Urban, Rural, and Farm Among Townships in Eastern Ontario Route Stage - East Study Area, 1981

Population Township	% Urban	% Rural	% Farm (% Total)	TOTAL
Gloucester	93.6	6.4	0.7	72,859
Cumberland	54.8	45.2	6.2	16,177
Osgoode	0.0	100.0	15.1	9,360
Russell	32.6	67.4	15.2	5,773
Cambridge	0.0	100.0	13.6	4,485
Winchester	0.0	100.0	37.8	3,010
Finch	0.0	100.0	30.2	2,280
Roxborough	0.0	100.0	31.3	3,035
S. Plantagenet	0.0	100.0	40.6	1,586
Osnabruck	0.0	100.0	14.8	4,230
Cornwall	23.7	76.3	8.0	5,175
Province of Ontario	81.7	18.3	3.3	8,625,000

Source: Statistics Canada. 1981. Xeroxed Sheets (not catalogued).

TABLE B6.3.3

Age Distribution of Population by Township in the Eastern Ontario Route Stage - East Study Area, 1981

Age Cohorts	0-14 yr		15-64 yr		65 yr		
Township	#	%	#	%	#	%	TOTAL
Gloucester	20,401	28%	50,273	69%	2,185	3%	72,859
Cumberland	4,692	29%	11,000	68%	485	3%	16,177
Osgoode	2,355	25%	6,360	68%	645	7%	9,360
Russell	1,444	25%	3,752	65%	577	10%	5,773
Cambridge	1,346	30%	2,915	65%	224	5%	4,485
Winchester	752	25%	1,987	66%	271	9%	3,010
Finch	547	24%	1,504	66%	228	10%	2,280
Roxborough	759	25%	1,912	63%	364	12%	3,035
S. Plantagenet	365	23%	1,062	67%	159	10%	1,586
Osnabruck	1,020	24%	2,660	63%	550	13%	4,230
Cornwall	1,242	24%	3,519	68%	414	8%	5,175
Province of Ontario	1,887,000	22%	5,870,000	68%	868,000	10%	8,625,000

Source: Statistics Canada. 1981. Selected population, dwelling, household and census family characteristics, for Census Divisions and Subdivisions.

TABLE B6.3.4

Mother Tongue of Population by Township for Eastern Ontario Route Stage - East, 1981

	Mother Tongue (%)						
Township	English	French	German	Dutch	Ukranian	Other	TOTAL
Gloucester	64	29	1			6	72,859
Cumberland	54	42	1	1		1	16,177
Osgoode	86	8	1	2		3	9,360
Russell	36	60	1	1		2	5,773
Cambridge	25	74	1				4,485
Winchester	84	10	1	4		1	3,010
Finch	61	34	2	3			2,280
Roxborough	71	26	1	1		1	3,035
S. Plantagenet	26	72		1		1	1,586
Osnabruck	91	5	1	1		2	4,230
Cornwall	81	16	1	1		1	5,175
Province of Ontario	78	5	2	1	1	13	8,625,000

Source: Statistics Canada. 1981. Population showing 30 mother tongues by Census Subdivisions, Provinces and Canada.

B6.4 Lifestyle Considerations

Four lifestyles were identified in the eastern Ontario study area. These lifestyles became obvious from discussions held at the MPCs and were substantiated through published statistics, existing documents, and subsequent interviews.

The population of the study area is primarily rural; however, there are urban dwellers, those who live and work in urban centres, in the Ottawa area and the Cornwall area, the outer boundaries of the study area. Their activities in the study area are likely recreation-oriented: visiting friends or relatives or participating in outdoor recreation activities.

Resettlement from Ottawa into the rural areas is a common phenomenon in the non-urban areas of the City of Gloucester and Osgoode Township. A similar phenomenon, but to a lesser scale, is occurring in the Cornwall area in Cornwall Township. These ex-urbanites form part of the rural population but, unlike many of their neighbours, they are younger, better-educated, and have higher income jobs in the city. They bring with them urban values, tastes, and lifestyles. Their major motive for the move to the country is to pursue a rural lifestyle and of this lifestyle, they are very protective. There are often, however, incompatibilies between what the ex-urbanites perceive as rural life (that is, quiet and pastoral) and the realities of the commercial agriculture industry.

The farm population is another component of the rural population. It is, however, on the decline in eastern Ontario, having decreased about 16 percent since 1976. The continuing migration of farm populations to urban areas is primarily due to farm specialization, mechanization, and enlargement as well as the "cost-price squeeze" for agricultural products (McCrae, 1980). Those who farm in eastern Ontario, however, are engaged in traditional family farm enterprises on farm properties which tended to be somewhat smaller than the provincial average in 1981. These farmers support the feed mills, machinery dealers, and agricultural services located in the urban centres of Ottawa, Vars, Chesterville, Casselman, Finch and Cornwall.

The rural non-farm population, like the rural farm population, was often born and raised in the area. They tend to operate small businesses, often family-owned and agriculturally-oriented, or work in the secondary industry sector (ie, banks, retail, education, medical). They, too, are concerned about prime agricultural land being taken out of production and the problems associated with strip development along rural roads.

APPENDIX B6.5

Socio-Economic
Route Evaluation Criteria

The criterion, ability to handle change, relates to the capability of the people within the townships in the study area to adapt to change (ie, new residential development, commercial or industrial development). The three indicators were age (ie, the young (less than 15 years) and the old (over 65 years) are less tolerant of change); population growth rate (ie, rate of population change from 1976 to 1981); and development orientation (ie, current orientation of townships to primarily residential development, as determined by planners from the Ministry of Municipal Affairs and Housing who are based in Ottawa). The premise is that young, fast-growing townships which officially encourage development are likely more receptive to change than older, slower-growing, less development-oriented townships.

The criterion, compatibility with the community, refers to the compatibility of transmission lines with the character of the community. Although few communities would encourage the presence of transmission lines, certain communities would be more amenable to transmission lines than others; for example, urban areas are likely more receptive to transmission lines than rural farm areas, than rural non-farm areas, than rural estate areas. As with all general statements; however, this criterion must be qualified on a case-by-case basis. This criterion was based on knowledge of the lifestyle involved and analysis of the responses of these various groups to the proposed transmission line. The indicators of this criterion were: percent of the township population that was urban, rural, and farm; occurrence of rural residential properties; and percent of the 1981 total assessment that was commercial/industrial/business.

The criterion, economic base change, in a broad sense, reflects the relative economic change associated with each transmission route. The indicators were based on land use information obtained from the Land Use and Environmental Studies planners. The indicators relate to both the value of agricultural, forest and maple syrup sales loss associated with the respective losses of land and to municipal assessment losses associated with the removal of houses, farms, and businesses.[1] These indicators of economic change are gross estimates at best because the economic data were often only available on a per operator basis by township or a per hectare basis by township and the amount of land lost was calculated per hectare on a route sub-link basis and then approximated by township. Nonetheless, the data do, in a comparative sense, provide a perspective on the economic change associated with the routes.

---

[1] TRANSMISSION LINES DO NOT SIGNIFICANTLY INCREASE OR DECREASE THE MUNICIPAL TAX BASE. Most Ontario Hydro rights of way are acquired under easement and therefore the owner of the property continues to pay the property tax. If Ontario Hydro owns the right of way, then a realty payment-in-lieu (PIL) of taxes is made to the municipality. The assessment valuation for the PIL is based on the average assessment of adjacent property and is a similar taxation procedure to that applied to railway or municipal public utility lands.

The social/lifestyle change criterion refers to the qualitative changes, real or perceived, which could occur if transmission lines are built. Two indicators were used. The first, indicator changes to access, considered the extent to which the right of way would open up land to greater problems with trespassing or poaching. The second indicator, sense of community, attempted to describe changes to the character or use of a community which could occur as a result of the transmission lines. This may include communities which are divided by the line or which may experience some reduction in enjoyment of their community as a result of the line.

APPENDIX B6.6

SOCIO-ECONOMIC COMPARISON TABLES

APPENDIX B6.6.1

Socio-Economic Route Comparison Tables

AFGPP$_1$R / AFGPQQ$_1$R / ABGPP$_1$R / ABGPQQ$_1$R

	ABILITY TO HANDLE CHANGE			COMPATIBILITY WITH COMMUNITY			ECONOMIC BASE CHANGE				
Criteria/ Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	Rural Residential	Commercial/ Industrial Business as % Taxable Assessment[4]	Per Capita Assessment[4]	Value Agriculture Sales/ha[5]	Farm Capital Value/ha[5]	Forest Product Sales/ Operator[5]	Maple Syrup Sales/ Operator[5]
Gloucester	younger	+29%	- pro-development - large residential base	93.6% 6.4% 0.7%	yes	16.2%	$1,262	$515	$5,737	$3,240	X
Osgoode Twp	younger	+4%	- resettlement from Ottawa - strong agriculture - public pressure against development	0% 100% 15.1%	yes	9.8%	$1,084	$649	$4,475	$6,293	$12,440
Russell Twp	younger	+17%	- pro-development both residential and commercial - along Hwy 417 - agricultural base	32.6% 67.4% 15.2%	no	14.9%	$1,136	$620	$4,663	$3,400	$ 1,234
Winchester Twp	younger	-.2%	- strong agriculture bias - some resettlement pressure from Ottawa - residential growth mainly villages and hamlets	0% 100% 37.8%	no	20.2%	$1,614	$779	$4,579	X	X
Finch Twp	younger	-.1%	- strong agriculture bias - development in marginal land but little available - some aggregate potential	0% 100% 30.2%	no	9.1%	$1,565	$641	$3,960	X	$0

APPENDIX B6.6.1 (Cont'd)

Socio-Economic Route Comparison Tables

$AFGPP_1R$ / $AFGPQQ_1R$ / $ABGPP_1R$ / $ABGPQQ_1R$

	ABILITY TO HANDLE CHANGE			COMPATIBILITY WITH COMMUNITY			ECONOMIC BASE CHANGE				
Criteria/ Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	Rural Residential	Commercial/ Industrial Business as % Taxable Assessment[4]	Per Capita Assessment[4]	Value Agriculture Sales/ha[5]	Farm Capital Value/ha[5]	Forest Product Sales/ Operator[5]	Maple Syrup Sales/ Operator[5]
Osnabruck Twp	older	+9%	- pro-residential development - weak agriculture bias - development along Hwy 2 and Ingleside	0% 100% 14.8%	no	30%	$1,663	$322	$2,699	$5,221	X
Cornwall Twp	younger	+7%	- subdivision pressure from city - try to limit to marginal land	23.7% 76.3% 8%	yes	46%	$2,061	$311	$2,821	$39,080	X

1. Relative to provincial average.
2. Population growth in the 1976 to 1981 period.
3. Farm population as percent of total township population.
4. From 1981 Financial Statements.
5. 1981 Agricultural data.

APPENDIX B6.6.2

Socio-Economic Route Comparison Tables

ABENOR / ABEOR / ABENQU$_1$R

	ABILITY TO HANDLE CHANGE			COMPATIBILITY WITH COMMUNITY			ECONOMIC BASE CHANGE				
Criteria/ Location	Age[1]	Growth[2]	Development Orientation	Urban/ Rural/ Farm[3]	Rural Residential	Commercial/ Industrial Business as % Taxable Assessment[4]	Per Capita Assessment[4]	Value Agriculture Sales/ha[5]	Farm Capital Value/ha[5]	Forest Product Sales/ Operator[5]	Maple Syrup Sales/ Operator[5]
Gloucester	younger	+29%	- pro-development - large residential base	93.6% 6.4% 0.7%	yes	16.2%	$1,262	$515	$5,737	$3,240	X
Cumberland Twn	younger	+31%	- pro-agriculture - rural residential along Ottawa R.	54.8% 45.2% 6.2%	no	6.0%	$1,022	$520	$4,440	$1,344	$4,373
Russell Twp	younger	+17%	- pro-development residential & commercial mainly Hwy 417	32.6% 67.4% 15.2%	no	14.9%	$1,136	$620	$4,662	$1,133	$ 176
Cambridge Twp	younger	+22%	- pro-agriculture peak of development passed	0% 100% 13.6%	no	5.2%	$ 854	$663	$4,427	$4,335	$1,842
Roxborough Twp	same	+.8%	- pro-agriculture resident development in marginal land - market garden Moose Creek Bog	0% 100% 31.3%	no	8.0%	$1,277	$440	$3,166	$1,379	X
Cornwall Twp	younger	+7%	- subdivision pressure from city - try to restrict to marginal land	23.7% 76.3% 8.0%	yes	46.0%	$2,061	$310	$2,821	$3,006	X

1. Relative to provincial average.
2. Population growth in the 1976 to 1981 period.
3. Farm population as percent total population.
4. From 1981 Financial Statements.
5. 1981 Agricultural statistics.

APPENDIX B7

OFFICIAL PLANS AND ZONING BY-LAWS

Route	Cities/Townships Affected	Official Plans Affected	Conformity/ Non-Conformity	Zoning By-Laws Affected	Conformity/ Non-Conformity	Comments
Highway 417	1. Regional Municipality of Ottawa-Carleton	Ottawa-Carleton	Adequate general provisions	No comprehensive by-law	-	-
	2. City of Gloucester	Gloucester	Adequate general provisions	Gloucester	Adequate general provisions	-
	3. Township of Cumberland	Cumberland	Adequate general provisions	Cumberland	Adequate general provisions	-
	4. Township of Russell	Russell	Adequate general provisions	Russell	Adequate general provisions	Provided EA approval is obtained
	5. Township of Cambridge	No Official Plan	-	Cambridge	General provisions for public uses, but Ontario Hydro is not listed as a public use	-
	6. Township of Roxborough	Roxborough	Adequate general provisions	Roxborough	Adequate general provisions	-
	7. Township of Cornwall	Cornwall	Adequate general provisions	Cornwall	Adequate general provisions	-
	8. City of Cornwall	Cornwall	General policy permits use in all designations, but subject to numerous requirements	Cornwall	Adequate general provisions	-

Specific Comments: Five townships, the City of Cornwall, the City of Gloucester and the Regional Municipality of Ottawa-Carleton would be affected. This represents seven Official Plans and seven zoning by-laws. There is no Official Plan for the Township of Cambridge and while the Zoning By-law makes general provisions for public uses, Ontario Hydro is not listed as a public use.

Route	Cities/Townships Affected	Official Plans Affected	Conformity/ Non-Conformity	Zoning By-Laws Affected	Conformity/ Non-Conformity	Comments
115 kV Line	1. Regional Municipality of Ottawa-Carleton	Ottawa-Carleton	Adequate general provisions	No comprehensive by-law	-	-
	2. City of Gloucester	Gloucester	Adequate general provisions	Gloucester	Adequate general provisions	-
	3. Township of Osgoode	Osgoode	Silent with respect to policies governing electric power facilities	Osgoode	Adequate general provisions	-
	4. Township of Russell	Russell	Adequate general provisions	Russell	Adequate general provisions	Provided EA approval is obtained
	5. Township of Winchester	North Dundas Planning Area	Necessary public uses are allowed provided that the use does not detract from the primary function of the area	Winchester	Adequate general provisions	-
	6. Township of Finch	Finch	Adequate general provisions	Finch	Adequate general provisions	-
	7. Township of Osnabruck	Osnabruck	Adequate general provisions	Osnabruck	Adequate general provisions	-
	8. Township of Cornwall	Cornwall	Adequate general provisions	Cornwall	Adequate general provisions	-
	9. City of Cornwall	Cornwall	General policy permits use in all designations, but subject to numerous requirements	Cornwall	Adequate general provisions	-

Specific Comments: Six townships, the City of Cornwall, the City of Gloucester and the Regional Municipality of Ottawa-Carleton would be affected. This represents nine Official Plans and eight Zoning By-laws. The Township of Osgoode Official Plan is silent with respect to policy covering utilities, but its respective zoning by-law makes adequate provisions for Hydro facilities.

APPENDIX B8

RATIONALE FOR LOCATION AND DESCRIPTION OF ALTERNATIVE ROUTES

Link TSA

Location:

- From the Hawthorne TS, the link proceeds eastward, across Highway 417 to parallel the south side of the Canadian National Railway (CNR) to point A.

Rationale:

- It uses the south side of the CNR to avoid crossovers of the railway and to parallel an existing severance through agricultural land.

- It avoids residential concentrations south of Highway 417.

- It reduces the visual effects of paralleling Highway 417.

Link AB

Location:

- From point A the link parallels the south side of the CNR to the middle of Lot 5, Concession VII, of the City of Gloucester. It then turns south through the east half of the lot line until just south of the 7th Concession Road.

Rationale:

- It uses the south side of the CNR line to minimize the effects on adjacent residences and to parallel an existing severance.

- It avoids residential concentrations along the Russell Road and Regional Road 26.

- It avoids the CBC property in Lot 17, Concession V, of the City of Gloucester.

- Avoided parallelling the north side of Highway 417 which has the following proposed and existing land uses:

  (a) Designated (NCC) environmental protection areas in lots 16, 15, 14, 13, 12, Concession VI.
  (b) The Carlsbad Springs Forest in lots 4, 5, 7, 8, 9, 10, Concession VII.
  (c) A proposed residential development in Lot 15, Concession VI, adjacent to the interchange.

- The separation from Highway 417 provides a visual buffer between the line and the highway for most of the sub-route length.

- The sub-route's southern alignment in Lot 5, through the Carlsbad Springs Forest to Point B avoids the community of Carlsbad Springs, and the strip development on the 8th Concession Road east of Lot 5.

- The industrial use in Lot 5, Concession VI, on the south side of Highway 417, residential strip development on concession roads, and the abundance of forest cover (often absent in study area) were the main reasons that parallelling along the south side of Highway 417 was not considered in this sub-route.

Link BE

Location:

- The link parallels Highway 417 from Lot 5, Concession VIII, in the City of Gloucester, along the north end of the interchange at County Road 41, and continues progressively closer to Highway 417 to Lot 26, Concession VIII, Cumberland Township. The link travels east, parallel to the property fabric, to the middle of Concession VII. It then angles south following the south side of the CNR line, east of Vars. In the west half of Concession VIII at County Road 8 the link turns further south and travels diagonally to Concession IX, Lot 14 in Russell Township. The link parallels Highway 417 in a relatively straight line and meets the CNR line in Lot 18, Concession V, Cambridge Township. Parallelling the south side of the CNR line through Lot 16, the link turns south in Lot 5 to just south of the South Nation River. The link then turns east and follows a diagonal path along the south side of Butternut Creek, crossing county road 7 about the middle of Concession VIII, Cambridge Township. It then turns further east and follows the mid-concession property line to Point E at the CNR line.

Rationale:

- The continuous residential strip development restricts the Regional Road 41 crossing to an area south of Carlsbad Springs.

- It avoids an area north from Highway 417 to the CNR line which is heavily forested, including agreement forests in Concessions VIII and IX of Cumberland Township.

- It takes advantage of an interface between the mature forest and the immature forested land adjacent to Highway 417, minimizing the effects on the forest resources.

- It avoids residences, except near Highway 417 where a major transportation corridor already exists.

- The potential effects on agriculture and an industrial park south of the interchange on Highway 417 at County Road 41 restrict the possibility of a route south of Highway 417.

- It avoids the communities of Vars and Limoges.

- It stays north of Highway 417 since the area south of the highway is extensively cultivated agricultural land. There are also extensive residential strip developments on the concession roads, and industrial developments adjacent to the highway.

Rationale:

- It avoids residential development and highway commercial/ industrial development on both sides of the Highway 417 and County Road 33 interchange by crossing the county road north of Highway 417.

- It avoids a maple sugar bush south of Vars.

- The Larose Forest and future plans for rural estate lots preclude a link east of Vars.

- It uses the CNR line parallel to County Road 8 which would minimize new diagonal severances.

- A close parallel of Highway 417 in this area would require a number of angle towers which would increase the line length and the costs, as well as the visibility from Highway 417.

- The link from County Road 8 south minimizes the effects on an adjacent agreement forest, in Lot 19, Concession IX, Russell Township. It also avoids Limoges and the associated residential development west and south of that community.

- The link from the 9th Concession Road of Russell Township to the 9th Concession boundary minimizes forest removal and maintains a visual buffer between the link and Highway 417.

- In lots 22 through 27, Concession IV, and lots 22, through 24, Concession V of Cambridge Township, the link stays close to Highway 417 to avoid bisecting an agreement forest while maintaining a forested buffer along the highway.

- By parallelling the CNR line the link uses an existing diagonal severance, minimizes encroachment on adjacent residences and minimizes the effect on agricultural land.

- A turning tower adjacent to the CNR line avoids a diagonal easement on the land to the south.

- It avoids the area around the Highway 417 interchange near the Village of Casselman where there are extensive development plans including a golf course north of Butternut Creek, as well as existing commercial, industrial and residential developments

- A turning tower was located south of the South Nation River to maintain a setback from the riverbank.

Sub-route AFG

Location:

- At Point A in Lot 20, Concession V in the City of Gloucester, the sub-route travels on a slight diagonal south from the CNR line to the edge of Lot 18 in Concession VI just north of Concession VII. The sub-route travels along the edge of Lot 18 and continues south on the property fabric to the middle of the 9th Concession. In the 9th Concession, the route deviates west around Canadian Forces Base (CFB) Gloucester to the middle of Concession VII, Osgoode Township, to the existing 115 kV hydro transmission line in the middle of the west half of Lot 12. The sub-route then turns east and parallels the north side of the line through the hamlet of Kenmore to Point G, Lot 31, Concession X in Osgoode Township

Rationale:

- The sub-route alignment in this corridor minimizes potential forest removal, avoids homes, follows forest edges, and follows the property fabric to minimize effects on agriculture.

- The sub-route south of Highway 417 parallels the property fabric.

- An alignment east of CFB Gloucester would have required a diagonal crossing of farm land to use a mid-concession alignment, potentially affecting residential development and an area of rural estate development.

- The sub-route maximizes the use of an existing Hydro right of way by parallelling it at the far west side of the study area.

- The parallel of the existing transmission line on the north side avoids a sugar maple bush in Lot 20, Concession VIII of Osgoode Township, as well as homes along the 8th Concession Road.

- The deviation around the west side of CFB Gloucester provides a mid-concession location, avoids golf courses in lots 2 and 12, Concession VII, Osgoode Township, avoids a residential development in the west half of Lot 6, Concession VIII and avoids a rural estate development in the south half of Lot 12, Concession VIII.

- The diagonal alignment from Point A avoided a mature white pine stand and crossed Russell Road at a location which minimizes the effect on homes (e.g., possible removal or visual intrusion).

Link BG

Location:

- At point B in Lot 5, Concession VIII of Gloucester Township, the link travels straight south through forested land and then along an agricultural land-forest interface in Concession IX. The link continues in Osgoode Township travelling through the middle of the 10th Concession to County Road 6. The link then travels diagonally across lots 21, 22, and 23, where it follows property fabric to the existing line at Point G.

Rationale:

- The primary land use within this corridor is agriculture. The back lot line location avoids residences, generally affects only the woodlot edges, allows for tower placement adjacent to or straddling field boundaries thus minimizing interference with field operations.

- An eastern shift in the link at County Road 6 allows it to parallel the property fabric south of the Middle and South Castor Rivers.

Link GP

Location:

- The link uses an existing Ontario Hydro 115 kV transmission line easement southeast of Kenmore.

Rationale:

- The existing 115 kV line can be removed and replaced with the 500 kV line, thereby using an existing Hydro right of way and requiring only a small amount of new right of way. It means that there will only be one set of towers on active agricultural land.

Link EO

Location:

- The link follows a mid-concession alignment east from Point E (Lot 7, Concession VIII, Cambridge Township) to Lot 16, Concession X, Roxborough Township. The link then travels diagonally to the edge of Lot 10 in the south half of Concession IX. The link then travels south, to Highway 43 east of Monkland, following the property fabric with slight shifts to avoid homes near the concession roads. From Highway 43, the link continues south to almost Concession I. It then angles toward the southwest, north of McMillans Corners, to a point midway in Lot 30, Concession VIII of Cornwall Township. The link then runs straight south on property fabric to Concession VII, where the route angled westerly to Raisin River Junction.

Rationale:

- The portion of the link just east of Point E is located along the forest/agriculture interface in the Moose Creek Bog to minimize possible effects on both land uses. This bog is an extensively forested wetland, at one time partially drained and cleared for market gardening.

- The diagonal location across the cleared but now unused bog avoids actively farmed land to the east.

- It avoids a licensed quarry in lots 10 and 11, Concession X of Roxborough Township.

- The link on the property fabric avoids farm buildings, a mobile home park east of Warina, a licensed quarry in Lot 9, Concession IV of Roxborough Township, and a deer yard and a sugar maple complex east of Gravel Hill in concessions III and IV.

- The diagonal alignment running southeast from the middle of Concession I (Lot 10) avoids a planned estate development south of McMillans Corners, east of Highway 138. It also avoids two deer yards west of McMillans Corners in Concession I, Roxborough Township and Concession IX, Cornwall Township. This link also minimizes the severances across agricultural property.

- By travelling diagonally south from Point K, the link avoids homes within the 9th Concession and minimizes the effects on forest cover (deer habitat and sugar maple bushes) on both the east and west sides of the proposed alignment.

- By following the west side of the corridor the link avoids upland hardwood stands in lots 15, 16 and 17, Concession VIII of Cornwall Township.

- By turning south in Lot 20, Concession VIII of Cornwall Township into the Raisin River Junction, it provides a direct alignment, which avoids farm buildings.

Link EN

Location:

- From Point E, located in Lot 7, Concession VIII of Cambridge Township, the link parallels the CNR line for a short distance to Lot 6, Concession VIII, Cambridge Township. The link then travels south along the property fabric, with slight shifts to avoid residences, until Lot 29, Concession IV of Roxborough Township where it turns at the edge of a large woodlot, northeast of Avonmore. The link crosses the woodlot diagonally in an easterly direction until it reaches the CPR Line located approximately 1.2 km east of Avonmore. The link turns south avoiding residences and using lot lines. At the north side of the Newington Bog the link shifts slightly east while crossing the bog, then follows the lot line south to Point N, approximately .7 km north of the existing line along the east side of Lot 27, Concession IX, Cornwall Township.

Rationale:

- To minimize the effects on agricultural land, the link maximizes the use of an existing severance near point E.

- South of the railway the use of the interface between agricultural and forest land along the Moose Creek Bog reduces the effects on the agricultural land.

- To minimize the effects on agriculture, the majority of the link is located along the property fabric.

- This link avoids all buildings.

- It avoids licensed pits located in Lot 28, Concession VII and Lot 29, Concession VI, Roxborough Township.

- To minimize the forest cover removal, the woodlot crossing east of Avonmore takes advantage of an open area within the woodlot.

- The shift to the east in the Newington Bog is between licensed pits in lots 28, 27, 26 and 25, Concession IX, Cornwall Township, and avoids the Mud Lake Swamp deer concentration area.

Link NQ

Location:

- From Point N, north of the existing 230 kV line the link is oriented in a south-westerly direction to the middle of Lot 30, Concession VIII, Cornwall Township. At this point the link turns south following the property fabric within Lot 30, Concession VIII, and Lot 29, Concession VII. The link passes approximately 0.2 km east of Harrisons Corners and joins the existing 230 kV line at Point Q.

Rationale:

- The Mud Lake Swamp crossing uses an open area for the majority of its length.

- The link avoids crossing County Road 15, a main north-south transportation route.

- A deer yard in Concession VII, Cornwall Township, west of County Road 15 and north of the existing 230 kV line is avoided by using the east side of County Road 15.

- This link would join with an existing line, south of Point Q.

Link NO

Location:

- From Point N, located east of the Mud Lake Swamp in Lot 27, Concession IX, Cornwall Township, the link travels south for half a kilometer to meet the existing 230 kV line. The link then parallels the existing line on the north side to the Raisin River Junction (Point O)

Rationale:

- The link uses the property fabric and an existing easement, avoiding buildings and the Mud Lake Swamp deer yards.

- The link also avoids a pit just east of the Mud Lake Swamp in lots 26 and 25, Concession IX.

Link OR

Location:

- Commencing at Raisin River Junction, the link follows an existing 230 kV transmission line right of way into the St. Lawrence Transformer Station.

Rationale:

- this use of the existing right of way is the straightest, shortest route to St. Lawrence TS, thereby minimizing disruption to land use and the other environmental factors.

Sub-route PQQ_1R

Location:

- This sub-route follows the existing 230 kV line from Lunenburg Junction, Lot 1, Concession IV, Osnabruck Township into the St. Lawrence Transformer Station.

Rationale:

- To minimize the amount of new land which would have to be acquired, the sub-route maximizes the use of the existing right of way and uses an additional adjacent right of way owned by Hydro in the QQ_1R portion of the route.

Sub-route PP$_1$R

Location:

- The sub-route parallels the north side of the existing 115 kV right of way into the St. Lawrence TS, starting at Point P, Lot 1, Concession IV of Osnabruck Township.

Rationale:

- The sub-route uses a parallel of existing rights of way in order to reduce the amount of new right of way required.

Link P_1Q_1

Location:

- This link is located south of Hwy. 401 between the existing lines, east and west of County Road 15.

Rationale:

- It provides a means to access sub-route Q_1R in which there is additional Hydro-owned property located beside the right of way of the existing 230 kV transmission line. This reduces the amount of new right of way required.

APPENDIX B9

DESCRIPTION OF THE ENVIRONMENT AFFECTED BY ROUTE LINK

Factor	Description of Environment	Potential Effects	Possible Mitigation
TS-A Length: 1.6 km	Cost: $1.5 M		
Agricultural Resources	- crosses 0.23 km of Class 3 agricultural land of which 0.15 km is tiled drained	- the tower bases and the area required to provide manoeuverability around the towers may remove up to 0.04 ha from agricultural production	- use narrow base towers - minimize crossings of tile drainage systems by access routes
		- damage to tile drains	- repair damaged tile drains
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location
		- towers in headlands may affect machinery operations	
Appearance of the Landscape	- crosses flat to gently rolling landscape with little tree cover	- the line would be highly visible, especially from Hwy 417	- introduce supplemental plantings where appropriate
Biological Resources	- crosses Ramsay Creek	- construction and clearing of trees from flood plain may result in sedimentation and rutting	- avoid crossing stream with access route and retain vegetative buffer on creek banks
	- crosses 0.98 ha of secondary wildlife habitat	- removal of forest habitat	- use selective cutting wherever possible
Forest Resources	- crosses 2.5 ha of forested land along the edge of the stand	- removal of forest	- use selective cutting wherever possible
Heritage Resources	- no heritage resources		
Human Settlement	- no existing or planned developments		
Mineral Resources	- no mineral resources		
Recreational Resources	- no recreational resources		
Engineering Factors	- CNR line paralleled	- effects on the existing telecommunications system	- modify existing telecommunications system

Factor	Description of Environment	Potential Effects	Possible Mitigation
A-B Length: 8.9 km Cost: $4.7 M			
Agricultural Resources	- crosses 4.97 km of Class 3 agricultural land of which 4.31 km is tile drained	- the tower bases and the area required to provide manoeuverability around the towers may remove up to 0.7 ha from agricultural production	- narrow base towers - minimize crossings of tile drainage systems by access routes
		- damage to tile drains	- repair damaged tile drains
		- soil compaction	- reduce soil compaction and rutting through timing and construction and access route location
		- towers in headland may affect machinery operation	
Appearance of the Landscape	- the landscape is flat with the CNR tracks being located in a small farmed valley. The valley is overlooked by houses on the Russell Road and on the north side of the valley. There is forest cover on the higher ground on both sides of the valley.	- towers will be highly visible to residents but not travellers on the 417. The towers would be very prominent in the valley landscape.	- retain as much compatible vegetation as possible to minimize exposure and dominance of structures within view of residents
Biological Resources	- crosses 5.59 ha of primary wildlife habitat and 1.2 ha of secondary wildlife habitat	- removal of forest habitat	- selective cutting wherever possible
	- crosses lightly vegetated Bear Brook Creek	- construction and removal of trees from the flood plain may result in sedimentation and rutting	- selectively cut to maintain a vegetative buffer along banks - avoid crossing stream with access route
	- adjacent to Ramsayville Marsh	- could result in possible conflicts with waterfowl flight paths	
Forest Resources	- crosses 8.9 ha of forested land which, except for a large high quality woodlot west of Carlsbad Springs, is comprised mostly of small woodlots of low quality	- removal of forest	- selective cutting wherever possible
Heritage Resources	- crosses 8.9 km of historical cultural landscape	- route will be visible from Russell Road and associated historic buildings	- conduct pre-construction archaeological survey and remove or avoid artifacts found
	- crosses 10.7 ha of high archaeological potential	- disturbance of artifacts	
Human Settlement	- no existing or proposed developments		
Mineral Resources	- no mineral resources		

Factor	Description of Environment	Potential Effects	Possible Mitigation
A-B Length: 8.9 km	Cost: $4.7 M (Cont'd)		
Recreational Resources	- portion of subroute adjacent to the Mer Bleue and Ramsayville Marsh	- towers will be visible from lookout points and foot trails from within the Mer Bleue Bog. They would also be close to the proposed Ramsayville Marsh interpretive centre and its boardwalks.	
Engineering Factors	- CNR line paralleled	- affects existing telecommunications system	- modify existing telecommunications system

Factor	**Description of Environment**	**Potential Effects**	**Possible Mitigation**
B-G **Length: 16.4 km**	**Cost: $6.8 M**		
Agricultural Resources	- crosses 12.33 km of Class 2 agricultural land and 3.17 km of tile drainage	- the tower bases and the area required to provide manoeuverability around the towers may remove up to 1.98 ha of agricultural land from production	- narrow base towers - minimize crossings of tile drainage systems by access routes
		- damage to tile drains	- repair damaged tile drains
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location - placement of towers on property lines to reduce disruption to individual farms
Appearance of the Landscape	- the landscape is very flat with very little tree cover except at the Highway 417 crossing, near point B	- towers will be the focus of views of people travelling on Hwy 417, causing the towers to dominate these views	- compatible vegetation should be maintained at the highway crossing and additional compatible vegetation could be planted to improve the screen
Biological Resources	- crosses two vegetated watercourses (North and South Castor)	- construction and tree removal in flood plain could result in sedimentation and rutting	- avoid crossing streams with access routes - selectively cut to maintain vegetative buffer along banks
	- crosses 8.76 ha of primary wildlife habitat and 9.22 ha of secondary wildlife habitat	- loss of upland habitat within right of way	- selective cutting wherever possible
Forest Resources	- crosses 24.9 ha forested land	- removal of forest	- selective cutting wherever possible
	- two regeneration areas (one WIA, one Christmas tree farm) are affected, the first on the edge and the second in the middle	- loss of the resource	
Heritage Resources	- crosses 16.4 km of historic cultural landscape which is comprised primarily of early farmsteads along County Road 29	- towers will be visible from County Road 29	
	- no archaeological resources		
Human Settlement	- crosses one abandoned farm	- removal of barn	
	- no existing or proposed developments		
Mineral Resources	- no mineral resources		
Recreational Resources	- no recreational resources		
Engineering Factors	- crosses existing 230 kV line	- additional towers on existing line and higher towers for new line	

Factor	Description of Environment	Potential Effects	Possible Mitigation
A-F-G Length: 25.1 km Cost: $13.1 M			
Agricultural Resources	- crosses 13.7 km of Class 1-4 agricultural land of which 4.4 km is tile drained	- the tower bases and the area required to provide manoeuverability around the towers may remove up to 2.06 ha of agricultural land from production	- narrow base towers - minimize crossings of tile drainage systems by access routes
		- damage to tile drains	- repair damaged tile drains
		- soil compaction	- reduce soil compaction and rutting through scheduling construction and access road placement
		- second line of towers may affect machinery manoeuverability from point F to Russell DS	- line up new towers with existing towers where possible or place new towers on fence line
Appearance of the Landscape	- the landscape is mostly flat with gently rolling hills around point F. There is about 40% tree cover with very little east of the town of Metcalfe. Highway 417 would be in an area of discontinuous tree cover	- varying visibility along length	- retain compatible tree species and augment by introducing supplemental plantings where appropriate
Biological Resources	- crosses 34.4 ha of primary wildlife habitat and 4.5 ha of secondary wildlife habitat	- removal of forest habitat	- selective cutting wherever possible
	- crosses three lightly vegetated watercourses (North and Middle Castor River)	- construction and clearing of trees from flood plain may result in sedimentation and rutting	- selectively cut to maintain vegetative buffer along banks - avoid crossing stream with access route
Forest Resources	- crosses 45.7 ha of forest land	- removal of forest	- selective cutting where possible
		- two NCC agreement forests, two WIA's, one non-agreement plantation, and one area recently cleared for hybrid poplar production would be affected on AF. Two newly regenerated areas on FG will be affected.	
Heritage Resources	- crosses 2 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-construction archaeological survey and remove or avoid artifacts found
	- crosses 20 km of historic cultural landscape associated with historic buildings in Osgoode Township	- the route would not be generally visible to majority of buildings	

Factor	Description of Environment	Potential Effects	Possible Mitigation
A-F-G Length: 25.1 km Cost: $13.1 M (Cont'd)			
Human Settlement	- 4 residences and 3 farm complexes in proximity	- removal of lots from subdivision plan	
	- crosses a proposed 108 estate lot development		
Mineral Resources	- no mineral resources		
Recreational Resources	- crosses 4 recreational sites	- Poplar Grove Golf Course - use of four fairways will be severely affected	- where possible, avoid locating structures on fairways, greens or tee-off areas
		- interference with proposed expansion of Metcalfe Golf and Country Club	
		- interfere with possible use of Kenmore Recreation area and Circle J Riding Stable facilities	
Engineering Factors	- near Leitrim DND Communications site	- potential interference to radio receiving facilities	- detailed studies into electro magnetic interference effects to determine if remedial measures are needed
	- within 1600 m of navigational aid for Ottawa International Airport	- interference with flight navigational instruments	- relocate navigational beacon
	- crosses existing 230 kV line	- additional towers on existing line and higher towers for new line	

Factor	Description of Environment	Potential Effects	Possible Mitigation
B-E Length: 36.7 km	Cost: $19.8 M		
Agricultural Resources	- crosses 12.52 km of Class 2 and 3 agricultural land of which 2.67 km is tile drained	- the tower bases and the area required to provide manoeuverability around the towers may remove up to 1.92 ha of agriculture land from production	- narrow base towers - minimize crossings of tile drainage systems by access routes
		- damage to tile drains	- repair damaged tile drains
		- angle towers required to turn east at South Nation River will affect machinery operation	- reduce soil compaction and rutting through timing construction and access road placement
		- soil compaction	
Appearance of the Landscape	- the landscape is flat to very gently rolling with about 75% forest cover throughout most of the corridor, except near Limoges and Casselman	- the towers will be visible from Highway 417 for most of this section because of its closeness to the highway, however, long views would be limited by the density of forest cover	- retain a buffer of trees between the highway and the proposed right-of-way
Biological Resources	- crosses 98.19 ha of primary wildlife habitat and 6.05 ha of secondary wildlife habitat	- the main forest habitat removed will occur just south of Point B to township boundary (Gloucester - Cumberland) where it goes through more mature forest	- selective cutting wherever possible
		- east of the township boundary, the impact on wildlife will be more of an edge effect through immature forest	
	- three vegetated watercourses would be crossed (Shaw & Indian Creeks, tributary to South Nation River)	- construction and removal of trees from the flood plain may result in sedimentation and rutting	- selectively cut stream bank vegetation to maintain a buffer along bank - avoid crossing stream with access route
Forest Resources	- affects southern edge of Larose Forest, which is one of the most successful reforestation areas in Ontario. The woodlots between the towns of Vars and Limoges are well established.	- removal of forest resources	
	- crosses 89.7 ha of forest land which includes four agreement forests (21.6 ha), two WIA's (3.2 ha), one Canadian International Paper Ltd. forest (2.9 ha), and one sugar bush (2.9 ha)		- selective cutting wherever possible

Factor	Description of Environment	Potential Effects	Possible Mitigation
B-E Length: 36.7 km	Cost: $19.8 M (Cont'd)		
Heritage Resources	- crosses 11.2 km of historic cultural landscape accentuated by the log buildings on early farmsteads south of Vars	- would conflict with the historic character of the buildings	- retain as much compatible vegetation as possible
	- would cross 22.11 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-construction archaeological survey and remove or avoid artifacts found
Human Settlement	- four residences are in proximity		
	- no proposed developments affected		
Mineral Resources	- no mineral resources		
Recreational Resources	- no recreational resources directly crossed, although the route is within the viewshed of the Limoges Tent and Trailer Campground		
Engineering Factors	- none		

Factor	Description of Environment	Potential Effects	Possible Mitigation
G-P Length: 39.1 km	Cost: $16.3 M		
Agricultural Resources	- diagonally crosses 29.59 km of Class 2 to 3 agricultural land of which 6.81 km is tile drained	- the tower bases and area required to provide manoeuverability around the towers may remove up to 3.86 ha of agricultural land from production	- narrow base towers - minimize crossings of tile drainage systems by route access
		- damage to tile drains	- repair damaged tile drains
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location - placement of towers on property lines to reduce disruption to individual farms
Appearance of the Landscape	- the landscape is mostly flat with very little tree cover	- the line would be very visible	
	- the line crosses very close to a viewpoint just west of the town of Berwick	- provides long views of the entire right of way, south to Cornwall	
Biological Resources	- crosses 13.68 ha of secondary wildlife habitat and 4.04 ha of primary wildlife habitat	- loss of upland forest habitat	- selective cutting wherever possible
	- lightly vegetated crossing of the South Nation River	- construction and removal of trees from the flood plan may result in sedimentation and rutting	- selectively cut river bank vegetation to maintain a buffer along banks - access route will not cross the river
Forest Resources	- crosses 21.3 ha of forest land which includes one sugar bush (0.6 ha), one Domtar plantation (2.6 ha), two other plantations (2.4 ha) and three WIA's (3.8 ha) affected	- loss of forest resources - Domtar's plantation is a hybrid-poplar test planting (in Osnabruck Township) and they will probably finish the experiment in 1990	- selective cutting wherever possible
Heritage Resources	- crosses 29 km of historic cultural landscape, encroaching upon early farmsteads near North Winchester and Dixon	- landscape alteration limited with replacement of existing towers	
	- crosses 7.76 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-construction archaeological survey and remove or avoid artifacts found

Factor	Description of Environment	Potential Effects	Possible Mitigation
G-P Length: 39.1 km	Cost: $16.3 M (Cont'd)		
Human Settlement	- two rural residences, four farm residences and a commercial operation (seed cleaning facility) will be in proximity.		
	- no proposed developments affected.		
Mineral Resources	- crosses diagonally over a licensed quarry for 0.25 km	- potentially no towers in quarry - possible loss of some resources	- place tower on or close to license boundary
	- may touch corner of a licensed quarry for 0.06 km	- may require two or three towers in deposit - possible loss of some resources	- avoid placing tower on licensed property
	- crosses diagonally over a large pit operation for 0.75 km	- some loss of the resource	- place towers on exhausted portions of the pit or remove material in areas where towers are planned
	- crosses the corner of a small licensed pit for 0.05 km		- avoid tower placement on licensed property
	- crosses 3 deposits (1.66 ha) of granular B or C (2 are spannable and one may be located)		- span deposits where possible or minimize number of towers on deposit
Recreational Resources	- no recreational resources		
Engineering Factors	- crosses existing 1 cct, 230 kV line and a 2 cct, 230 kV line near point P (second crossover occurs only if connects with link PP_1)	- additional towers on existing line and higher towers for new line	

Factor	Description of Environment	Potential Effects	Possible Mitigation
E-N Length: 22.7 km	Cost: $9.6 M		
Agricultural Resources	- crosses 14.4 km of predominantly Class 2 agricultural land of which 2.49 km is tile drained land	- the tower bases and area required to provide manoeuverability around the towers may remove 2.16 ha of agricultural land from production	- narrow base towers
		- damage to tile drains	- minimize crossings of tile drainage systems by route access
		- turning towers required at CNR will affect machinery manoeuverability because of their location in the headlands	- placement of towers on property lines to reduce disruption to individual farms
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location
Appearance of the Landscape	- south of point E the landscape is flat and untreed until Con U11 of Roxborough Twp where the line would cross a visual edge	- high degree of visibility north of Concession V11	
	- south of Con U11, the landscape is rolling with 30-40% tree cover and the east/west roads tend to be on the crests	- skylining and high degree of contrast	
Biological Resources	- crosses the edge of one deer concentration area - (2.44 ha)	- loss of deer habitat	- selective cutting whenever possible
	- crosses three areas of primary wildlife habitat (23.21 ha) and 1.98 ha of secondary wildlife habitat	- removal of forest habitat	
	- crosses Newington Bog through a narrow section (8.07 ha)	- may affect wildlife movement	
	- crosses edge of Stoney Creek Swamp (1.83 ha)		
Forest Resources	- crosses 53.4 ha of forest land which include two Domtar Poplar plantations (6.0 ha), one WIA (0.7 ha) and one MNR plantation would be affected, mostly on the edges	- loss of forest resources	- selective cutting whenever possible

Factor	Description of Environment	Potential Effects	Possible Mitigation
E-N Length: 22.7 km	Cost: $9.6 M (Cont'd)		
Heritage Resources	- crosses 15.4 km of historic cultural landscape, noteworthy is the crossing of the agricultural landscape west of and in view of the Village of Avonmore	- transmission line will visually contrast with agricultural landscape	
	- crosses 9.1 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-consultation archaeological survey and remove or avoid artifacts found
Human Settlement	- seven farms in proximity		
Mineral Resources	- crosses one aggregate deposit of granular A material (just east of Northfield .88 ha)	- possible loss of resource	- remove resource prior to construction of transmission line
Recreational Resources	- no recreational resources		
Engineering Factors	- none		

Factor	Description of Environment	Potential Effects	Possible Mitigation
E-U Length: 33.5 km	Cost: $14.4 M		
Agricultural Resources	- crosses 15.99 km of predominantly Class 2 agricultural land of which 3.35 km is tile drained land	- the tower bases and area required to provide manoeuverability around the towers may remove 2.14 ha of agricultural land from production	- narrow base towers
	- crosses potential market gardening at Moose Creek Bog	- damage to tile drains	- minimize crossings of tile drainage system by route access
			- repair damage to tile drains
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location
	- link bisects farms presently using aerial spraying, east of point E	- may inhibit aerial spraying near point E	- placement of towers on property lines to reduce disruption to individual farms
Appearance of the Landscape	- the landscape is flat and untreed north of Con 14 of Roxborough Twp where the route crosses a visual edge	- high visibility north of Concession 14	
	- South of Con 14, the roads tend to follow east/west crests	- skylining and high degree of contrast at edge	
		- long views to the north and south of towers prominently skylined on major crests	
Biological Resources	- crosses 66.01 ha of primary wildlife habitat value and 7.99 ha of secondary	- loss of habitat	- selective cutting wherever possible
	- crosses two deer concentration areas (1.22 ha)	- loss of forested deer habitat	
	- crosses a woodlot in Moose Creek Bog area (8.68 ha)		- selective cutting wherever possible
Forest Resources	- crosses 83.2 ha of forest land including one sugar bush in Cornwall Township	- loss of sugar maple production and forest resources	- selective cutting wherever possible
Heritage Resources	- crosses 26.6 km of historic cultural landscapes which contain early farmsteads with treed fence-rows, original wooden barns and ornate trim on farm-houses (east of Warina)	- transmission line will visually contrast with agricultural landscape	

Factor	Description of Environment	Potential Effects	Possible Mitigation
E-O Length: 33.5 km Cost: $14.4 M (Cont'd)			
	- crosses 9 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-construction archaeological survey and remove or avoid artifacts found
Human Settlement	- one rural and 3 farm residences are in proximity		
	- no proposed developments affected		
Mineral Resources	- crosses the corner of a small pit operation (0.05 km)	- potential loss of some resources	- avoid locating tower on property
	- crosses diagonally a small pit operation for 0.63 km		- avoid placing towers on portion of licensed area which contains the granular A deposit
	- crosses two aggregate deposits of granular A material (1.46 ha)		- avoid placing towers on deposits or span deposits if possible
	- crosses one aggregate deposit of granular B or C material (0.59 ha)		- remove resource prior to operation of the transmission line
Recreational Resources	- no recreational resources		
Engineering Factors	- none		

Factor	Description of Environment	Potential Effects	Possible Mitigation
O-R Length: 8.0 km	Cost: $2.9 M		
Agricultural Resources	- crosses 1.93 km of primarily Class 2 and 3 agricultural land of which 0.5 km is tile drained	- tower bases and land required for manoeuverability around tower bases may remove 0.24 ha of agricultural land from production	- narrow base towers
		- parallel of existing lines will result in additional towers to manoeuver machinery around	
		- damage to tile drains	- minimize crossings of tile drainage systems by route access
			- repair damage to tile drains
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location
			- placement of towers on property lines to reduce disruption to individual farms
Appearance of the Landscape	- landscape is rolling to gently rolling with about 50% tree cover and some significant crests	- paralleling existing lines will minimize the degree of change, but towers would begin to dominate their surroundings	
Biological Resources	- crosses emergent marsh already crossed by existing line (1.25 ha)		- span the marsh and avoid crossing with access route
	- crosses lightly vegetated watercourse - Raisin River	- construction and tree removal in flood plain could result in sedimentation and rutting	- span the watercourse, retain existing vegetation
			- avoid crossing river with access route
Forest Resources	- crosses 2.77 ha of secondary wildlife habitat	- loss of forest habitat	- selective cutting wherever possible
	- crosses 9.9 ha of forest land of which 0.8 ha is a WIA	- loss of forest resources	- selective cutting wherever possible
	- woodlots along existing 230 kV line would be affected along their edges		

Factor	Description of Environment	Potential Effects	Possible Mitigation
O-R Length: 8.0 km	Cost: $2.9 M (Cont'd)		
Heritage Resources	- crosses 8 km of historic cultural landscape and crosses historic Dundas Street and County Road 18	- historic stone houses within viewshed of link paralleling two existing transmission lines	
	- crosses 1.62 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-construction survey and remove or avoid artifacts found
Human Settlement	- one residence removed		
	- 3 residences and 2 farm complexes in proximity		
	- no proposed developments affected		
Mineral Resources	- no mineral resources		
Recreational Resources	- adjacent to Cornwall Recreational Centre	- visible to users of Cornwall Recreation Centre - low degree of effect	
Engineering Factors	- crosses existing 230 kV line	- additional towers on existing line and higher towers on new line	

Factor	Description of Environment	Potential Effects	Possible Mitigation
N-O Length: 5.3 km	**Cost: $2.6 M**		
Agricultural Resources	- crosses .6 km of Class 2 agricultural land	- the tower bases and land required for manoeuverability around the towers may remove 0.08 ha of agricultural land from production	- narrow base towers
		- parallel existing lines will result in additional towers in fields to manoeuver machinery around	
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location
			- placement of towers on property lines to reduce disruption to individual farms
Appearance of the Landscape	- the landscape is rolling to gently rolling farmland with large woodlots	- towers on crests would be very visible	
Biological Resources	- crosses the edge of the Stony Creek Swamp (6.67 ha)	- will alter wetland to a minor extent because it is along the edge	- avoid crossing with access roads where possible
	- crosses 7.7 ha of primary wildlife habitat	- could affect wildlife movements - the other location is an edge effect	
	- affects one primary wildlife habitat woodlot in a central location	- expansion of right of way may affect wildlife movement	- selective cutting wherever possible
	- crosses edge of a deer concentration area (5.6 ha)	- loss of deer habitat	
Forest Resources	- crosses 13.2 ha of forest land which includes one WIA (2.8 ha)	- loss of forest resources	- selective cutting wherever possible
Heritage Resources	- crosses 5.3 km of historic cultural landscape paralleling the existing right of way	- parallel of existing transmission line minor change to cultural landscape	- retain as much compatible vegetation as possible
	- crosses 2.54 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-construction archaeological survey and remove or avoid artifacts found
Human Settlement	- two farm residences would be in proximity		
	- no proposed developments affected		

Factor	**Description of Environment**	**Potential Effects**	**Possible Mitigation**
N-U **Length: 5.3 km**	**Cost: $2.6 M** (Cont'd)		
Mineral Resources	- crosses corner of small pit operation for 0.08 km	- possible loss of some resources	- avoid placement of tower on licensed property
	- crosses diagonally a small pit operation for 0.6 km requiring a maximum of three towers		- minimize the number of towers on the property and where possible place towers on poor quality or exhausted portions of the existing pit
	- crosses two aggregate deposits of granular A material (1.38 ha)		- avoid placing towers on deposits
			- remove resource prior to operation of the transmission line
Recreational Resources	- no recreational resources		
Engineering Factors	- none		

Factor	Description of Environment	Potential Effects	Possible Mitigation
N-Q Length: 6.5 km	Cost: $3.4 M		
Agricultural Resources	- crosses 2.07 km of Class 2 agricultural land	- tower bases and land required to manoeuver around tower bases may remove from production 0.28 ha of agricultural land	- narrow base towers
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route locations
			- placement of towers on property lines to reduce disruption to individual farms
Appearance of the Landscape	- the landscape is rolling to gently rolling farmland with large woodlots	- towers located on crests would be very visible	
Biological Resources	- crosses Stony Creek Swamp but majority (80%) is through open field (6.76 ha)	- loss of deer and forest habitat	- selective cutting wherever possible
			- avoid crossing wetland with access roads where possible
	- crosses 4.2 ha of deer concentration area		
	- crosses 5.37 ha of primary wildlife habitat		
Forest Resources	- crosses 18 ha of forest land	- loss of forest resources	- selective cutting wherever possible
Heritage Resources	- crosses 6.5 km of historic cultural landscape	- right of way crosses close to Harrison Corners, an early settlement in an agricultural landscape	
	- crosses 5 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-construction archaeological survey to remove or avoid artifacts found
Human Settlement	- one farm in proximity		
	- no proposed developments affected		
Mineral Resources	- runs along the length of an aggregate deposit containing granular B and C material (5.27 ha)	- possible loss of some resources	- place alignment along edge of deposit to minimize the degree of sterilization and keep the number of towers to a minimum
	- crosses two other smaller deposits of granular B or C material (1.56 ha)		- avoid locating towers on these deposits
Recreational Resources	- no recreational resources		
Engineering Factors	- cross over existing 230 kV line at point Q and a 1 cct, 230 kV line north of point Q	- additional towers on existing line and higher towers for new line	

Factor	Description of Environment	Potential Effects	Possible Mitigation
Q-01 Length: 2.0 km	**Cost: $0.8 M**		
Agricultural Resources	- crosses .23 km of agricultural land	- tower bases and land required to manoeuver around towers may remove from agricultural production .04 ha	- narrow base towers
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location
			- placement of towers on property lines to reduce disruption to individual farms
Appearance of the Landscape	- the landscape is gently rolling with about 50% tree cover	- there would be little change to the appearance of the landscape	
Biological Resources	- 4.1 ha of primary wildlife habitat crossed along forest edge	- removal of forest habitat adjacent to existing right of way	- selective cutting wherever possible
Forest Resources	- 4.7 ha of forested land would be crossed mostly along the edges of woodlots	- removal of forest resources	- selective cutting wherever possible
Heritage Resources	- crosses 2 km of historic cultural landscape parallel to the existing right of way	- minimal change to landscape with presence of existing transmission line	
	- crosses 0.05 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-construction archaeological survey and remove or avoid artifacts found
Human Settlement	- no existing or proposed development affected		
Mineral Resources	- no mineral resources		
Recreational Resources	- no recreational resources		
Engineering Factors	- none		

Factor	Description of Environment	Potential Effects	Possible Mitigation
U1-R Length: 5.6 km	Cost: $2.2 M		
Agricultural Resources	- crosses 1.15 km of Class 2 agricultural land	- tower bases and land required to manoeuver around towers may remove from agriculture production 0.16 ha	- narrow base towers
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location
			- placement of towers on property lines to reduce disruption to individual farms
Appearance of the Landscape	- the landscape is gently rolling with about 40% forest cover	- the line will have little effect on the appearance of the landscape	
Biological Resources	- affects 2.6 ha of primary and 1.5 ha of secondary wildlife habitat	- loss of forest habitat	- selective cutting wherever possible
Forest Resources	- 6 ha of forested land crossed, mostly along the edges which includes one Domtar Tree Farm Agreement area (0.5 ha) affected at its northeast corner	- loss of forest resources	- selective cutting wherever possible
Heritage Resources	- crosses 5.6 km of historic cultural landscape, as well as historic Dundas St. with early farmsteads on both sides of the line	- minimal change to landscape paralleling existing transmission line	
	- crosses 1 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-construction archaeological survey and remove or avoid artifacts found
Human Settlement	- one residence in proximity		
	- no proposed developments affected		
Mineral Resources	- crosses the corner of a licensed quarry (0.08 km)	- possible loss of some resources	- avoid placement of tower on the licensed property
Recreational Resources	- the route is close to the Cornwall Recreational Centre	- towers will be visible but should have no effect on recreational activities	
Engineering Factors	- none		

Factor	Description of Environment	Potential Effects	Possible Mitigation
P-U	Length: 4.7 km Cost: $2.7 M		
Agricultural Resources	- crosses 1.99 km of Class 2 agricultural land	- the tower bases and land required to manoeuver around the towers may remove from agricultural production 0.24 ha of land	- narrow base towers
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location
			- placement of towers on property lines to reduce disruption to individual farms
Appearance of the Landscape	- the landscape is rolling with 60-70% forest cover within the corridor. The route would cross a major crest at County Road 18.	- towers will be skylined on the major crest and the entire right of way to the south would be highly visible from County Road 18	
Biological Resources	- crosses 7.4 ha of primary wildlife habitat	- loss of forest habitat	- selective cutting wherever possible
Forest Resources	- 7.9 ha of forested land crossed	- loss of productive forest resources	- selective cutting wherever possible
Heritage Resources	- crosses 4.7 km of historic cultural landscape crossing of County Road 18, parallel to an existing line	- parallel of existing transmission line minor change to landscape	
	- crosses 3 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-construction archaeological survey and remove or avoid artifacts found
Human Settlement	- 4 residences in proximity		
	- no proposed development affected		
Mineral Resources	- no mineral resources		
Recreational Resources	- no recreational resources		
Engineering Factors	- crosses existing 230 kV line	- additional towers on existing line and additional angle towers and higher towers for new line	

Factor	Description of Environment	Potential Effects	Possible Mitigation
P-P1 Length: 5.2 km	Cost: $2.7 M		
Agricultural Resources	- crosses 0.95 km of Class 2 agricultural land	- tower bases and land required to manoeuver around towers may remove from agricultural production 0.12 ha of land	- narrow base towers
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location
			- placement of towers on property lines to reduce disruption to individual farms
Appearance of the Landscape	- the landscape is rolling with 60-70% forest cover. Two major crests would be crossed.	- the towers will be skylined on crests and highly visible from County Road 18	
Biological Resources	- crosses 11.49 ha of primary and 1.06 ha of secondary wildlife habitat	- loss of forest habitat	- selective cutting wherever possible
	- one vegetated watercourse crossed (Black River)	- construction and clearing of trees within the flood plain may result in sedimentation and rutting	- avoid crossing with access route and retain vegetative buffer on river banks
Forest Resources	- crosses 14.4 ha of forest land	- loss of productive forest resources	- selective cutting wherever possible
Heritage Resources	- crosses 5.2 km of historic cultural landscape, parallel of existing lines in view of early farmsteads on County Road 18	- parallel of existing transmission line minor change to landscape	
	- crosses 2.37 ha of high archaeological potential	- disturbance of artifacts	- conduct pre-construction archaeological survey and remove or avoid artifacts found
Human Settlement	- one farm residence in proximity		
	- no proposed developments affected		
Mineral Resources	- crosses diagonally a small pit operation for 0.3 km	- possible loss of some resources	- place tower on property boundary or where aggregate is exhausted or is of low quality or quantity
	- crosses diagonally a small pit operation for 0.69 km		- minimize the number of towers on the property and place the towers with the least amount of disruption to the operation
			- remove resource prior to operation of transmission line
Recreational Resources	- no recreational resources		
Engineering Factors	- none		

Factor	**Description of Environment**	**Potential Effects**	**Possible Mitigation**
P1-R Length: 6.5 km	**Cost: $3.5 M**		
Agricultural Resources	- crosses 1.1 km of Classes 2 and 4 agricultural land	- tower bases and land required to manoeuver around towers may remove from agricultural production 0.12 ha of land	- narrow base towers
		- soil compaction	- reduce soil compaction and rutting through timing construction and access route location
			- placement of towers on property lines to reduce disruption to individual farms
Appearance of the Landscape	- landscape is gently rolling with about 50% forest cover. Industrial land uses affect the existing character of the area.	- little change to the appearance of the landscape	- retain compatible vegetation on the ROW
Biological Resources	- 4.75 ha of primary wildlife habitat is crossed through a central portion	- may affect wildlife movement	- selective cutting wherever possible
	- crosses 5.39 ha of secondary wildlife habitat	- loss of forest habitat	
Forest Resources	- crosses 13.3 ha of forest land which includes one WIA	- loss of forest resources	- selective cutting wherever possible
Heritage Resources	- crosses 6.5 km of historic cultural landscape, including historic Dundas Street in view of early farmsteads, paralleling an existing line	- paralleling an existing transmission line minor affect on landscape	
Human Settlement	- one house will require removal		
	- three residences and one farm will be in proximity		
	- adjacent to existing and new garbage dump development by City of Cornwall	- may disturb existing landfill during construction	- avoid construction activities in area of landfill
	- small private airstrip near the route may be affected	- may interfere with or create hazardous conditions for aircraft flight patterns	
Mineral Resources	- crosses diagonally a licensed quarry (0.42 ha)	- may lose some of the resource	- place towers on property boundary where possible
			- remove resource prior to operation of the transmission line
Recreational Resources	- no recreational resources		
Engineering Factors	- none		

Factor	Description of Environment	Potential Effects	Possible Mitigation
P1-Q1 Length: 1.3 km Cost: $0.8 M			
Agricultural Resources	- no agricultural resources		
Appearance of the Landscape	- parallels Hwy 401 in a wooded area and will result in two heavy angle towers adjacent to the highway	- may draw attention to the highway crossing and increase visual impact	
Biological Resources	- crosses edge of primary wildlife habitat adjacent to Hwy 401 (6.63 ha)	- loss of forest habitat	- selective cutting wherever possible
Forest Resources	- 4.4 ha of forested land crossed	- removal of forest resources	- selective cutting wherever possible
Heritage Resources	- no heritage resources		
Human Settlement	- no existing or proposed development affected		
Mineral Resources	- no mineral resources		
Recreational Resources	- no recreational resources		
Engineering Factors	- none		

APPENDIX C

PUBLIC INVOLVEMENT

APPENDIX C1

REGIONAL COMMITTEE

C1.1 List of Members

C1.2 Terms of Reference

C1.3 Summary of Meetings

C1.1 List of Members

Organized by area of representation:

Recreation

Mr. Jim Windsor
South Nation River
Conservation Authority

Minerals

Mr. Norvan Grant
Cornwall Gravel Co. Ltd.

Mr. Terry Blair
& Mr. Arthur Blair
St. Albert Quarry

Agricultural

Mr. John MacDonald
Ontario Ministry of Agriculture and Food
Winchester, Ontario

Mr. Cliff Howse
Dundas County
Federation of Agriculture

Mr. Barry Armstrong
Stormont County
Federation of Agriculture

Mr. Robert Gratton
Russell County Federation of Agriculture

Mr. Lawrence St. Denis
Glengarry County
Federation of Agriculture

Forestry

Mr. George Velema[1]
Domtar Inc.

Biological

Ms. Vivian Brownell
Ottawa Field Naturalists

Land Use

Mr. Myles Mahon
Regional Municipality
Ottawa Carleton

Mr. Chuck Miller
County Planner
Stormont, Dundas, Glengarry County

Mr. David Sherwood
Canadian Institute of Planners

Mr. Mike Otis[2]
Planning Department
City of Cornwall

Heritage

Mrs. Barbara Seargeant
Ontario Historical Society

Mr. Jim Pendergast
Ontario Archaeological Society

Municipalities

Mr. Fred Alexander
Osgoode Township

Mr. Gaston Patenaude
Russell Township

Mr. Gerry Bertrand
Cambridge Township

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[1] Replaced Carl Burke who attended Meeting #1.

[2] Alternate is Gary Wood or Steven Alexander.

Association of Municipal Electrical Utilities

Mr. William Moulton
Gloucester Hydro

Direct Customers

Mr. Jim De Haan[3]
Canadian Industries Limited

Government Ministries

Mr. Bryan McCue
Ministry of Natural Resources
Cornwall, Ontario

Mr. Bill Stevens
Ministry of the Environment
Kingston, Ontario

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[3] Transferred to Burlington, Ontario prior to Meeting #5. No longer a member of committee.

C1.2 Terms of Reference - Regional Committee - November 1982

1.0 Background

2.0 Role of the Regional Committee

3.0 Criteria for Membership on Committee

4.0 Organization of the Regional Committee

5.0 Proposed Schedule of Meetings

6.0 Tentative Meeting Agendas

7.0 Remuneration

1.0 BACKGROUND

Ontario Hydro will be carrying out studies to locate routes for transmission lines during the next 12 months.

As part of a program to involve the public in this study, two regional committees will be set up: one for the area east of Ottawa, and one for the area west of Ottawa.

This document outlines the terms of references for these committees.

2.0 THE ROLE OF THE REGIONAL COMMITTEE

Within Eastern Ontario there are different perspectives on the problems associated with locating transmission corridors. Hydro's planning team has the responsibility to consider these different perspectives when making decisions about the proposed route.

The regional committee will be one of the publics consulted during the route stage study. Recommendations made by the committee will therefore be considered along with the recommendations made by government agencies, private industry, and the general public.

THE PRIMARY ROLE OF THE COMMITTEE IS TO ASSIST HYDRO IN LOCATING TRANSMISSION CORRIDORS BY PROVIDING A REGIONAL OVERVIEW OF THE ISSUES AND CONCERNS RELATED TO LOCATING TRANSMISSION LINES.

To carry out this role, members of the group will be responsible for:

- advising on the importance of criteria used to identify alternative corridors
- acting as a liaison between the project team and their parent organization
- reviewing and commenting on key decisions throughout the route stage study.

3.0 CRITERIA FOR MEMBERSHIP ON COMMITTEE

- Regional committee members should be representative of municipalities, provincial or federal agencies, regional interest groups, or the private sector who have an interest in the study area.
- Members should be available to attend a total of five meetings within the next 12 months. The major working meeting(s) will be held during November and December of this year, while a possible three additional review meetings will be held next year.
- If an individual who does not represent an organization expresses an interest in being on the committee, then that individual should forward a letter to the community relations officer. The individual will be invited to attend meetings as an observer and may become an official member if the committee accepts him or her.

4.0 ORGANIZATION OF THE REGIONAL COMMITTEE

Initially, the group will be formed by Ontario Hydro Community Relations staff. The first meeting will be organized by Ontario Hydro.

After the initial meeting, dates and locations of meetings, meeting agendas, and meeting procedures will be worked out jointly by the group and Hydro staff.

Ontario Hydro will provide a person to record meeting notes.

5.0 PROPOSED SCHEDULE OF MEETINGS

1) Orientation - Study Process - Nov 1982
   Distribute List of Location Criteria

2) Rating of Corridor Location Criteria - Dec 1982

3) Review Alternative Corridors - Winter 1983

4) Review Alternative Routes - Spring 1983

5) Review Recommended Route - Summer 1983

6.0 TENTATIVE MEETING AGENDAS

Meeting 1: Orientation

Purpose of Meeting:

- committee members meet each other and meet the Hydro team
- committee members become familiar with the overall study process and the study area
- committee members understand, in some detail, how corridors will be located
- committee members prepare to discuss criteria for locating corridors with their parent organizations
- distribute criteria form for external completion

Meeting 2: Rating of Location Criteria

- members return completed criteria forms
- Hydro presents potential effects criteria and rating
- develop joint committee - Hydro ranking
- finalize ranking through general discussion

Meeting 3: Review of Alternative Corridors

Purpose of Meeting:

- to present the environmental constraint maps

- to outline the rationale for locating each of the alternate corridors
- to provide an opportunity to comment on site specific concerns within the alternative corridors
- to provide an opportunity to comment on alternative corridors
- to provide an opportunity to suggest any additional alternatives prior to evaluation
- to present information on each of the alternative corridors at a scale of 1:50,000

Meeting 4: Review Alternative Routes

Purpose of Meeting:

- to present detailed information on each alternative route as a basis for comment
- to provide an opportunity for the committee to state a preference for a particular alternative route
- to provide an opportunity to comment on site specific concerns within the alternative routes

Meeting 5: Review Preferred Route

Purpose of Meeting:

- to present detailed information on the preferred route as a basis for comment
- to provide an opportunity to suggest small scale changes in the route location
- to obtain the position of the committee regarding the preferred route

7.0 REMUNERATION

. Regional committee members will be reimbursed for all out of pocket expenses for accommodation, food, and travel at the following rates:

accommodation - at cost
food - at cost
travel - 23¢/km*

. Ontario Hydro has a policy of not reimbursing group members for time spent on advisory group work.

* may be adjusted

C1.3 Summary of Meetings

Meeting #1 - Friday and Saturday, November 19 and 20, 1982

Purpose:

To discuss and agree on the role of the committee, provide members with an introduction and sufficient background on the project and Hydro's planning process to enable them to rate the importance of local resources from the perspective of their representative organizations.

Results:

The project history and an overview of construction activities associated with a high voltage transmission line were provided. The committee terms of reference were accepted by the members. The environmental planning process and the technical and economic constraints to locating alternative corridors were outlined. Members were asked to provide a preliminary rating of local resources from the perspective of their representative organizations by the next meeting.

Meeting #2 - Saturday, December 11, 1982

Purpose:

To discuss members' preliminary rating of local resources and develop an average committee rating, to present Ontario Hydro's rating of possible effects on local resources. To develop an overall rating of resources and to agree how to group the objectives into constraint levels.

Results:

An average rating of resources was developed. However, after Hydro presented its possible effects rating, a majority of several members questioned the rating for various resources.

A motion was moved and adopted by the committee to have the opportunity to review Hydro's possible effects rating in order to be able to develop an overall rating and agree on threshold groupings of resources. Members were to rate possible effects and Hydro would then prepare a revised set of possible effects and overall ratings.

Meeting #3 - Monday, January 10, 1983

Purpose:

To obtain member agreement on possible effects ratings and overall ratings. To discuss appropriate constraint levels. To present criteria for corridor identification.

Results:

Hydro's possible effects rating and the committee's revised rating were discussed for those five resources where the committee values differed from Hydro's. An overall rating and threshold levels were agreed to.

The criteria for corridor identification were discussed.

Meeting #4 - Monday, March 28, 1983

Purpose:

To present and discuss the alternative corridors, discuss the upcoming MPCs and the future role of the committee.

Results:

The committee decided that while they were generally satisfied with the corridors, it was not necessary for them as a group to formally endorse them. Members were asked to discuss the corridors with their parent organizations and provide comments by the end of April. The members expressed the wish to be kept informed as to the status of future study developments.

Meeting #5 - Tuesday, August 21, 1984

Purpose:

To review status of the study since the deferral and to present and discuss the alternative routes. To discuss future role of the committee. To provide an overview of future activities, including the MPCs and upcoming public hearings.

Results:

Members determined that a further meeting was required after the MPCs to discuss the routes and provide comments from their representative organizations for Hydro's use in evaluating the alternatives. After some discussion, the members determined that an endorsement of the routes in general or any one in particular was not within their role, nor was it their wish to do so.

Meeting #6 - Thursday, October 11, 1984

Purpose:

To review recent MPCs and response of local residents to the routes. To obtain member comments on the alternative routes.

Results:

Members provided comments from their representative organizations on the route alternatives. The members expressed the wish to be kept informed of future study developments prior to the selection of a recommended route.

Meeting #7 - To be held in March 1985

Purpose:

To review recent MPCs and response of local residents on recommended route. To obtain member comments.

APPENDIX C2

MUNICIPAL PARTICIPATION CENTRES

C2.1 List of Municipal Participation Centres - Alternative Corridors

C2.2 List of Municipal Participation Centres - Alternative Routes

C2.3 Public Comment Forms - Alternative Corridors
- Alternative Routes

APPENDIX C2.1

List of Municipal Participation Centres - Alternative Corridors

March and April 1983

MUNICIPALITY	DATE
Cambridge Township (St. Albert)	March 28
Winchester Township (Morewood)	March 29
Cornwall Township (Bonville)	March 30
Finch/Osnabruck Townships (Berwick)	March 31
Roxborough Township (Moose Creek)	April 6
Russell Township (Embrun)	April 13
City of Gloucester (Leitrim)	April 19
Osgoode Township (Metcalfe)	April 20
City of Cornwall (Cornwall)	April 21
South Plantagenet Township (Fournier)	April 26
Cumberland Township (Leonard)	April 27

APPENDIX C2.2

List of Municipal Participation Centres - Alternative Routes

September 1984

MUNICIPALITY	DATE
Russell Township (Embrun)	September 5
Cambridge Township, South Plantagenet Township and Village of Casselman (St. Albert)	September 6
Cumberland Township (Leonard)	September 10
City of Gloucester (Leitrim)	September 11
Finch, Osnabruck, and Winchester Township (Berwick)	September 12
Osgoode Township (Metcalfe)	September 13
Roxborough Township (Moose Creek)	September 17
City of Cornwall and Cornwall Township (Bonville)	September 18

APPENDIX C2.3

PUBLIC COMMENT FORMS

SPRING 1983

EASTERN ONTARIO STUDY
COMMENT FORM

Ontario Hydro is in the process of locating a route for new transmission lines in Eastern Ontario. Alternative corridors, much wider than the actual route required, have now been located. This comment form is intended to record your concerns about the corridors and your views about what we should consider when locating a transmission line.

A. Alternative Corridors

1. Is your property affected by one of the corridors?

YES ________ NO ________ CLOSE BY ________

a) If yes or close by, then which corridor? ____________

Please list any information about this corridor that we should know about.

____
____
____
____
____
____
____

2. What other information should we consider when locating a route?

____
____
____
____
____
____
____

B. When locating a transmission line, Ontario Hydro should:

	Agree	Uncertain	Disagree
• Follow property or concession lines			
• Keep costs down by avoiding turns in the line and taking the most direct route			
• Avoid significant environmental areas			
• Follow existing Hydro rights-of-way			
• Other (specify)			

C. Other Comments

____
____
____
____
____
____
____

Name ____________________
Address ____________________
Lot, Concession ____________________
Occupation ____________________
Phone ____________________

Community Relations
Ontario Hydro
H8 E4
700 University Avenue
Toronto, Ontario
M5G 1X6

COMMENTS——COMMENTS——COMMENTS

Eastern Ontario Study: Cornwall to Ottawa

Ontario Hydro is planning the location of a new 500 kV transmission line from Cornwall to Ottawa. Several ALTERNATIVE ROUTES have now been identified. Your answers to the following questions will help us to choose a route which will be recommended to the government for approval.

- PLEASE PRINT -

1. i) Do you OWN or RENT property that is crossed by one of the alternative routes?

YES ____________ NO ____________

ii) Where is this property? Lot ____________________ Concession ____________________

Township ____________________ City ____________________

iii) What is the land use on this property?

Please check (✓) Please describe

☐ house or farm building ____________________

☐ cultivated field ____________________

☐ pasture ____________________

☐ industrial or commercial property ____________________

☐ forested area ____________________

☐ other ____________________

iv) How do you think your use of this land will change if it is crossed by a new transmission line?

2. Many things will be considered when comparing and selecting a route from the two basic ALTERNATIVE ROUTES and among the ROUTE OPTIONS. Keeping in mind the local area and the information presented at this centre, please give your opinion on the following:

i) Does one of the two basic ALTERNATIVE ROUTES seem better than the other? If so, then which one? Why? (Please identify using the letters on the maps).

ii) If more than one ROUTE OPTION is located in your township, is there any ROUTE OPTION that seems better than the others? If so, then which one(s)? Why? (Please identify using the letters on the maps).

NAME: ____________________

MAILING ADDRESS: ____________________

TELEPHONE: ____________________

Christopher Taylor
Eastern Ontario Study
Ontario Hydro, Room H8 E4
700 University Avenue
Toronto, Ontario
M5G 1X6

Please keep the bottom copy. Deposit the top copy in the box provided, or mail to the address above.

September 1984

APPENDIX C3

MUNICIPAL POSITIONS RECEIVED

Township of Finch - April 6, 1983

Village of Casselman - April 12, 1983

Township of Russell - April 13, 1983

Township of Cambridge - May 2, 1983

Township of Osgoode - September 18, 1984

Township of Roxborough - October 2, 1984

Township of Cumberland - September 25 and October 2, 1984

United Counties of Prescott and Russell - November 27, 1984

Township of Finch

Letter dated April 6, 1983:

"It is the feeling of Council that, because so much good tile-drained land is involved in this corridor, and because of the fact that this Municipality already has three existing tower lines passing through the Township, it is therefore requested by Council that one of the other alternative routes be utilized by Ontario Hydro when making a decision as to the final location of the route."

Village of Casselman

Resolution carried April 12, 1983:

"That Council express to the Ontario Hydro Commission its dissatisfaction and opposition to the proposed route of the transmission line described in their Eastern Ontario study. Further, that Council insist that a meeting be held in the municipality to discuss the issue."

Township of Russell

Resolution carried by Township of Russell Planning Area April 13, 1983:

"We as planners are quite concerned in not creating a third line within the Township of Russell. We would therefore recommend to the Ontario Hydro that one of the existing corridors be given strong consideration."

Township of Cambridge

Resolution #192 (in French) dated May 2, 1983:

That the Municipal Council of the Township of Cambridge request Ontario Hydro not to construct the new power transmission line on one of the alternative routes designated as Corridors E-J and E-K for the following reasons:

- corridors E-J and E-K are situated on first class agricultural land;

- many local improvements have been made on these farms; in particular underground drainage and municipal drains.

Township of Osgoode

Letter dated September 27, 1984:

"... we should like to advise you that, at its meeting of September 18, 1984, a decision was reached by Council to unanimously support the 417 Route."

Township of Roxborough

Resolution passed October 2, 1984:

"It was duly moved and seconded that Council do not approve of the Ontario Hydro Alternative Routes in Roxborough Township for the following reasons: Route along

138 Highway will interfere with approved 102 lot subdivision, 2 Industrial Blocks, 2 Commercial Blocks and 36 Market Gardening lots at Lots 13, 14, 15 and Part 16 - Concessions 9 and 10, also a 33 lot subdivision and 12 Blocks presently under construction at Lot 11 - Concession 5. The West route in Roxborough Township will interfere with the airstrip at Lot 29 and 30 - Concession 3 that is presently in use and affect good agricultural lands; and a copy of this Resolution be forwarded to Mr. C. Taylor of Ontario Hydro and Mr. Noble Villeneuve, M.P.P."

Township of Cumberland

Resolution of Planning Advisory Committee (No. 125) dated September 25, 1984:

"That Planning Advisory Committee recommends that Hydro should have a view over the longer term and have an easement wider than they have recommended, that is, an easement suitable for two 500 kV lines which thereby eliminates considerable costs in the future."

Resolution of Council (No. 0793) dated October 2, 1984:

"That Council endorses Planning Advisory Committee's recommendation regarding a wider hydro easement."

United Counties of Prescott and Russell

At its November 27, 1984 session:

"The Council of the United Counties of Prescott and Russell endorsed the resolution of the Russell County Federation of Agriculture pertaining to the installation of a 500 kilowatt volt line.

Council is in agreement that the new proposed line should be located in the Kenmore, Finch, Newington corridor which is the Southern Route."

APPENDIX D

TELECOMMUNICATIONS

D1 Development of a Study Area

The straight line distance between the proposed microwave radio terminal station at Hawthorne TS in Ottawa and the proposed terminal station at St. Lawrence TS in Cornwall is approximately 74 km (46 miles). The maximum distance between adjacent microwave radio stations in the Ontario Hydro system is typically less than 48 km (30 miles). Given this, it was necessary to consider a microwave radio repeater station between these two terminal stations.

For the identification of alternative repeater station sites and the ultimate selection of a preferred site, a study area was developed based on two sets of criteria. The first set was technical in nature and produced a general zone in which a study area could be established. The second set consisted of environmental and technical criteria which were applied within this general zone to arrive at a study area with well defined boundaries. The following provides an explanation of what these criteria were and how they were applied.

Radii of 48 km (30 miles) were drawn from Hawthorne TS towards St. Lawrence TS and vice versa defining the maximum desirable radio signal transmission distance from these two terminal points. These two radii were continued until they crossed each other. The resultant closed in area became the general zone within which a study area was to be located.

With the general zone established, a second set of criteria was defined and applied to assist in reducing the general zone down to a study area with well defined boundaries. These criteria were as follows:

- exclude urban and recreation areas where possible;
- exclude large wetland areas;
- exclude relatively large inaccessible areas;
- exclude large areas of relatively low elevation;
- keep the number of municipalities potentially affected to a minimum if the area remaining is sufficient to identify a reasonable number of alternative sites;
- exclude areas outside the Route Stage study area.

Both the general area and the resultant study area are shown in Figure D1.

D2 Description of the Study Area

The study area falls within portions of Winchester and Finch townships.

Agriculture is the predominant land use with the majority of these lands having agricultural capabilities ranging from Classes 2 to 4. The main agricultural systems are mixed crops, corn and hay interspersed with smaller areas of pasture. Some abandoned fields are also present and are generally found in association with shallow soils and rock outcrops.

The forest cover is classed as highly productive but is very localized, representing a small portion of the whole study area. There is one agreement forest southeast of Morewood and approximately ten Woodland Improvement Act agreements.

The soils range from clay loam to loam to fine sandy loam. Muck soils are also found but are confined to the area south of Morewood. The topography is generally flat to gently rolling. A relatively large forested wetland occurs southeast of Morewood, providing good habitat for deer.

An active limestone quarry operation is located northwest of Crysler in addition to a number of licensed sand and gravel pits found at the western and eastern ends of the study area.

There are no confirmed or reported archaeological sites, however, a number of areas of high Paleolithic archaeological potential have been identified.

The areas of human settlement concentration and of historic significance are the Villages of Morewood, North Winchester, and Crysler.

The farms are evenly distributed throughout the study area and the road network is laid out in a grid pattern, however, travel routes are restricted in the large wetland area southeast of Morewood and across the South Nation River south of Crysler. No recreation resources were identified in this study area.

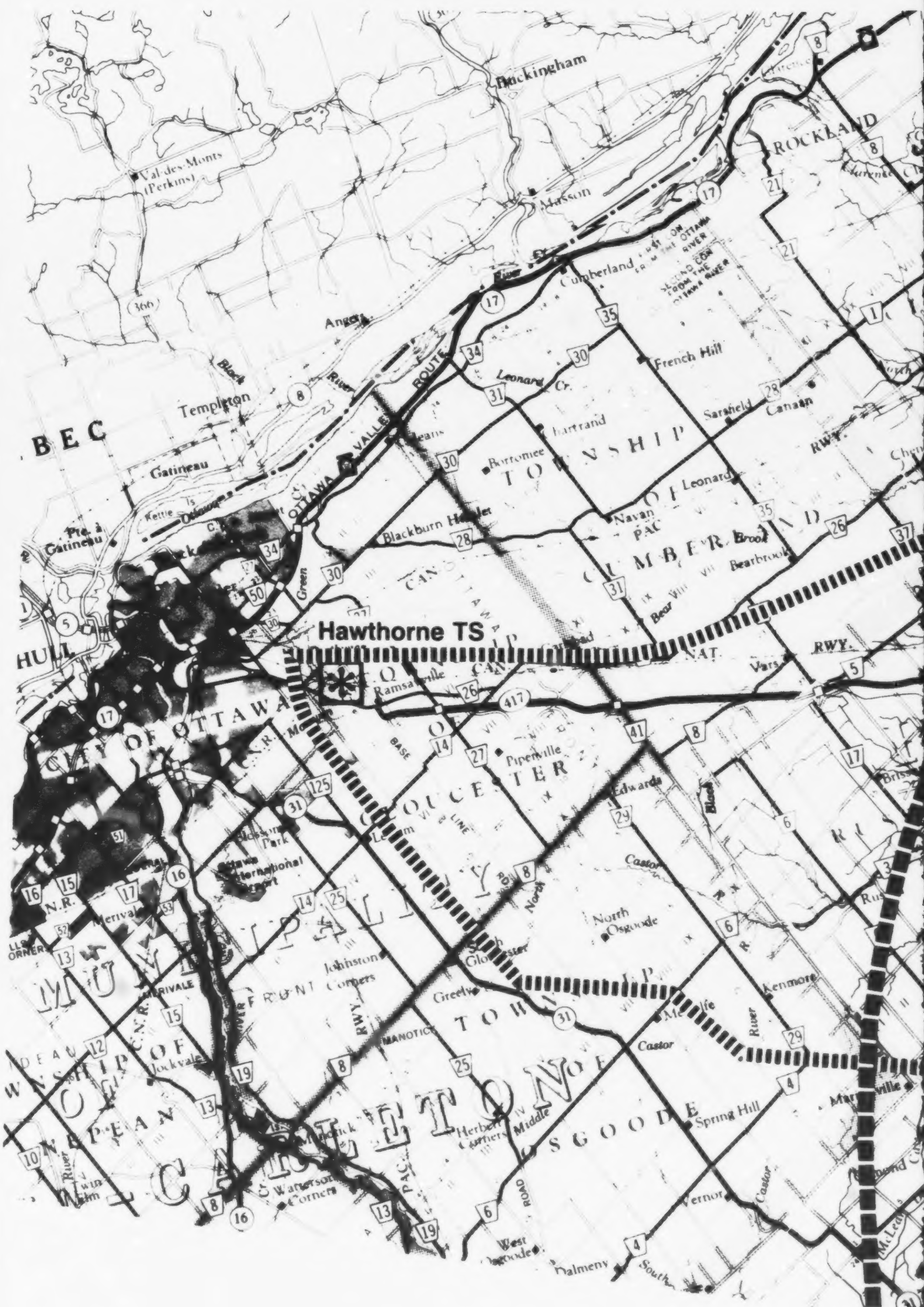
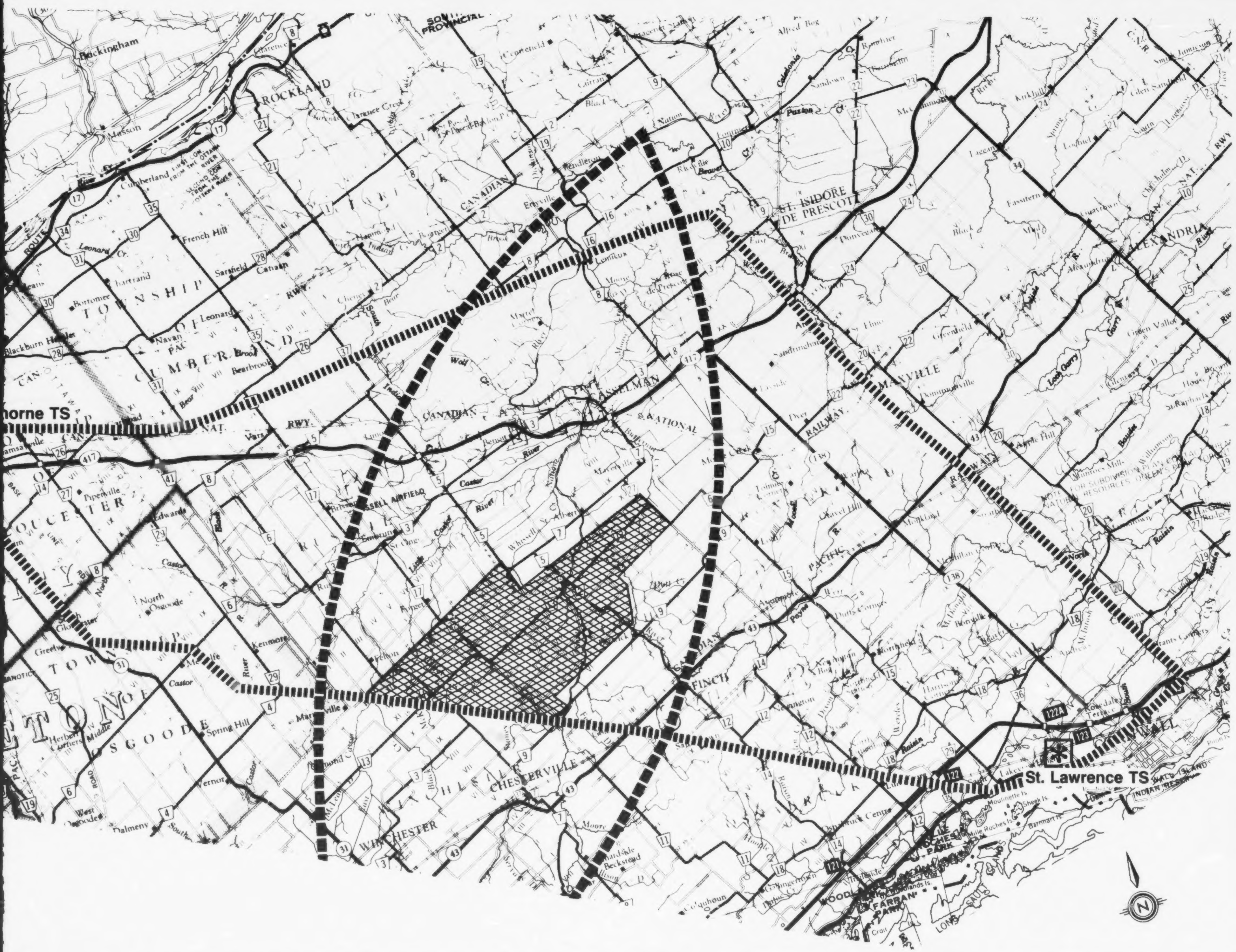

Hawthorne TS
Buckingham
Val-des-Monts (Perkins)
Masson
Cumberland
ROCKLAND
Angers
Templeton
Gatineau
BEC
HULL
CITY OF OTTAWA
Blackburn Hamlet
Ramsayville
French Hill
Sarsfield
Canaan
Navan
Leonard
Bearbrook
Vars
Pipeville
Edwards
North Osgoode
Kenmore
Blossom Park
Ottawa International Airport
Merivale
Johnstons Corners
Jockvale
Greely
Manotick
Herbert Corners
Middle
Spring Hill
Vernon
West Osgoode
Dalmeny
Castor
Watterson Corners
TOWNSHIP OF CUMBERLAND
GLOUCESTER
OSGOODE
NEPEAN
CARLETON
417
17
8
31

Figure D1
Study Area Development

✳	Terminal Station
☐	Transformer Station
▮▮▮▮▮▮	Transmission Study Area Boundary
■■■	General Zone
▨	Telecommunications Study Area

Note: All boundaries are approximate



Buckingham
Masson
ROCKLAND
Cumberland
French Hill
Sarsfield
TOWNSHIP OF CUMBERLAND
Navan
Blackburn Hamlet
horne TS
CASSELMAN
ST. ISIDORE DE PRESCOTT
ALEXANDRIA
MAXVILLE
RUSSELL AIRFIELD
GLOUCESTER
North Osgoode
OSGOODE
FINCH
CHESTERVILLE
WINCHESTER
St. Lawrence TS
CANADIAN NATIONAL RWY.
CANADIAN PACIFIC RAILWAY
Loch Garry
N

MF. Roll No.	Rev.	Date	Particulars	Drawn	App'd

Ontario Hydro
Design and Development Division -
Transmission

Drawn by: K. Kolyn
Supervising Planner:
Date: March 1985
Supervising Project Engineer:
Work Order: 840-03017
Graphics Prod. Supervisor: Henderson
Scale: 1:250,000
Drawing No.: RS170-LUEP-RA6-0050
Rev.: 0
Sheet: 1 of 1

D3 Environmental Situations and Assigned Constraint Level Ratings

(H - High, M - Medium, L - Low)

Factor	Category	Situation	Rating
Agricultural Resources	Agricultural Land Use Systems	- monoculture	H
		- corn system	H
		- mixed system	M
		- hay system	L
		- pasture system	L
		- grazing system	L
	Tile Drainage	- location of tile drains	H
Appearance of the Landscape	Viewsheds of Human Settlements	- primary viewsheds of urban and rural residential concentrations	M
		- secondary viewsheds of urban and rural residential concentrations	L
Biological Resources	Wetlands	- high value wetlands	H
	Wildlife Communities	- high value deer yard	H
		- low value deer yard	L
Forest Resources	Forest Management Areas	- WIA	H
		- Conservation Authority Forest	H
		- Agreement Forest	H
	Productivity of Forest Land	- high productive forest land	M
Heritage Resources	Known Historic Sites	- settlements	H
	Areas of High Paleolithic Archaeological Potential	- Paleolithic Areas	M
Human Settlement	Existing Land Use	- non-urban commercial industrial/institutional concentrations	M
		- rural residential concentrations	H
		- urban settlements	H

(H - High, M - Medium, L - Low)

Factor	Category	Situation	Rating
Mineral Resources	Possible Sand and Gravel Reserves	- possible sand and gravel reserves	M
	Unique Geologic Features	- class I site	H
	Existing Mineral Industries	- active licensed pit	H
		- active licensed quarry	H
Recreation Resources	Existing Recreation	- conservation authority reforestation areas	H

D4 Rationale for Ratings of Environmental Situations

AGRICULTURAL RESOURCES

Tile Drained Fields

- rated high because of the high capital expenditure and the improved productivity created

Monoculture/Corn

- rated high because these areas represent management input and generally high soil productivity

Mixed Agriculture

- rated medium due to the variability in soil capability
- these areas have a greater likelihood of containing a compatible site for a microwave tower (one with poorer quality soils)

Hay, Pasture and Grazing Areas

- rated low because of the prevalence of marginal or unsuitable agricultural soils on which effects would be low

APPEARANCE OF THE LANDSCAPE

Primary Viewsheds of Urban and Rural Residential Concentrations

- rated medium because of the number of viewers and the visual "intrusion" that a microwave tower could represent if located in proximity to residential properties

Secondary Viewsheds of Urban and Rural Concentrations

- rated low as compared to the medium rating for the primary viewsheds because of an increase in distance between the viewers and the tower site thus reducing the visual impact

BIOLOGICAL RESOURCES

Wetlands

- rated high because of the high degree of recognition by government and naturalist groups, sensitivity to change and level of disturbance

Wildlife Communities

- deer yards are rated high or low based on the quality of the habitat for food and shelter and the level of importance placed on these areas by government

- rare and unusual faunal habitat are rated high due to their recognition by government and naturalist groups and their sensitivity to physical alteration

FOREST RESOURCES

Forest Management Areas

- rated high because of the high combined investments of time, manpower and capital to increase productivity

- they constitute parts of MNR's policy areas

High Productive Forest Land (outside of forest management areas)

- rated medium due to lower capital investment for forest management purposes but still contribute to MNR's forestry objectives and targets

HERITAGE RESOURCES

Known Historic Sites

- rated high because of their recognized historical and cultural significance

- tower development on these sites would detract greatly from the historical theme being portrayed

Areas of High Archaeological Potential

- areas of high archaeological potential are rated medium because the possible existence of artifacts in these areas cannot be precisely determined, however they do provide a greater likelihood of future finds

HUMAN SETTLEMENT

Rural Residential Concentrations

- rated high due to incompatibility between this use and a microwave tower

- immediate views would be negatively affected

Urban Settlements

- rated high due to a relatively higher number of potential viewers

- also may represent an incompatible use if located in or adjacent to a residential area

- higher property costs

Non-Urban Commercial, Industrial, Institutional Concentrations

- rated medium since these areas are generally more compatible

- vacant and compatible portions may be present within these areas, however, not rated lower due to land costs

MINERAL RESOURCES

Possible Sand and Gravel Reserves

- rated medium because the loss of the resource would be small due to the small size of the tower site needed (i.e., 30 metres square) and the quantity and quality of the resource is variable

- these areas, however, are not rated lower because they do represent policy areas as defined by MNR

Existing Mineral Industries (Licensed Pits and Quarries)

- rated high due to the high level of capital investment and expected high quality of the resource present

Unique Geologic Features

- rated high because of scientific or educational value and a recognized need to preserve these sites

RECREATIONAL RESOURCES

Existing Recreation Areas

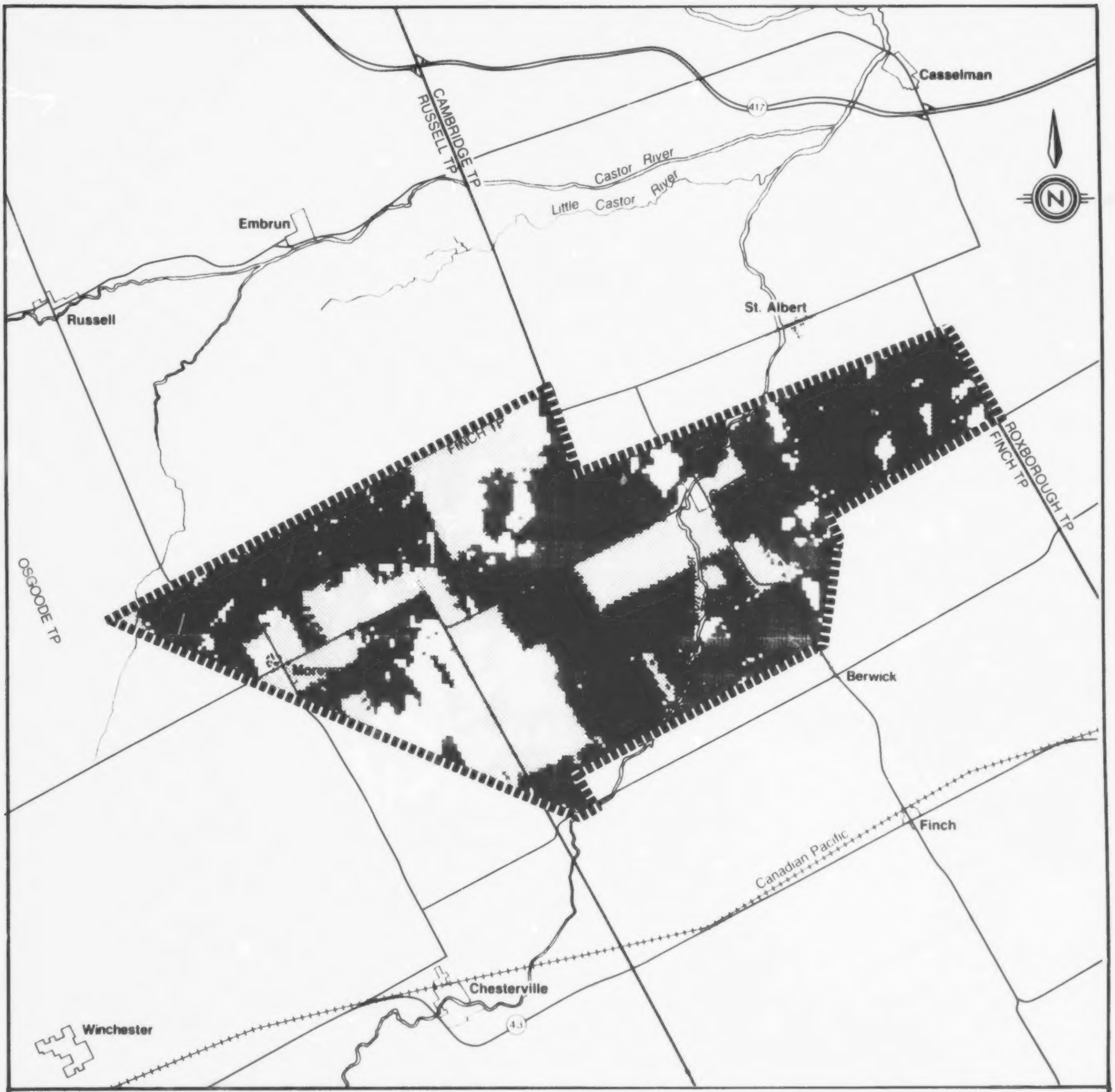
- rated high because a tower could eliminate a portion of an operation or physically interfere with recreational activities resulting in a loss of recreational opportunities

- a tower located in such areas may detract from the recreationist's expectations

- recreation areas are generally frequented by a number of people thus the visual impact becomes greater

APPENDIX D5

ENVIRONMENTAL FACTOR AND COMPOSITE CONSTRAINT MAPS



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Winchester

Winchester/Finch Study Area

Agricultural Resources

Legend

▪▪▪▪▪▪ Study Area Boundary

■ High Constraint

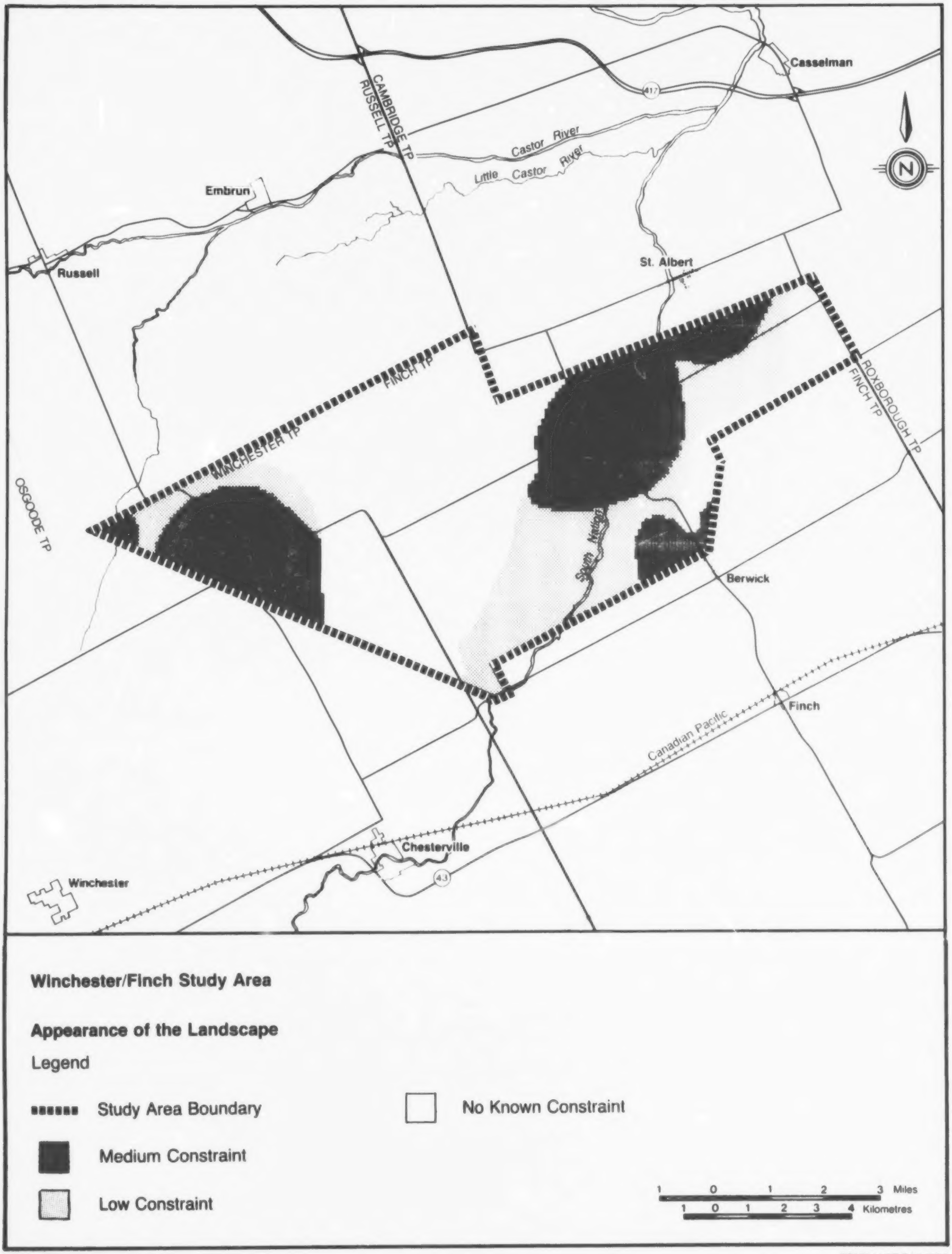
▩ Medium Constraint

☐ Low Constraint

☐ No Known Constraint

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres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1 0 1 2 3 Miles
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Winchester/Finch Study Area

Appearance of the Landscape

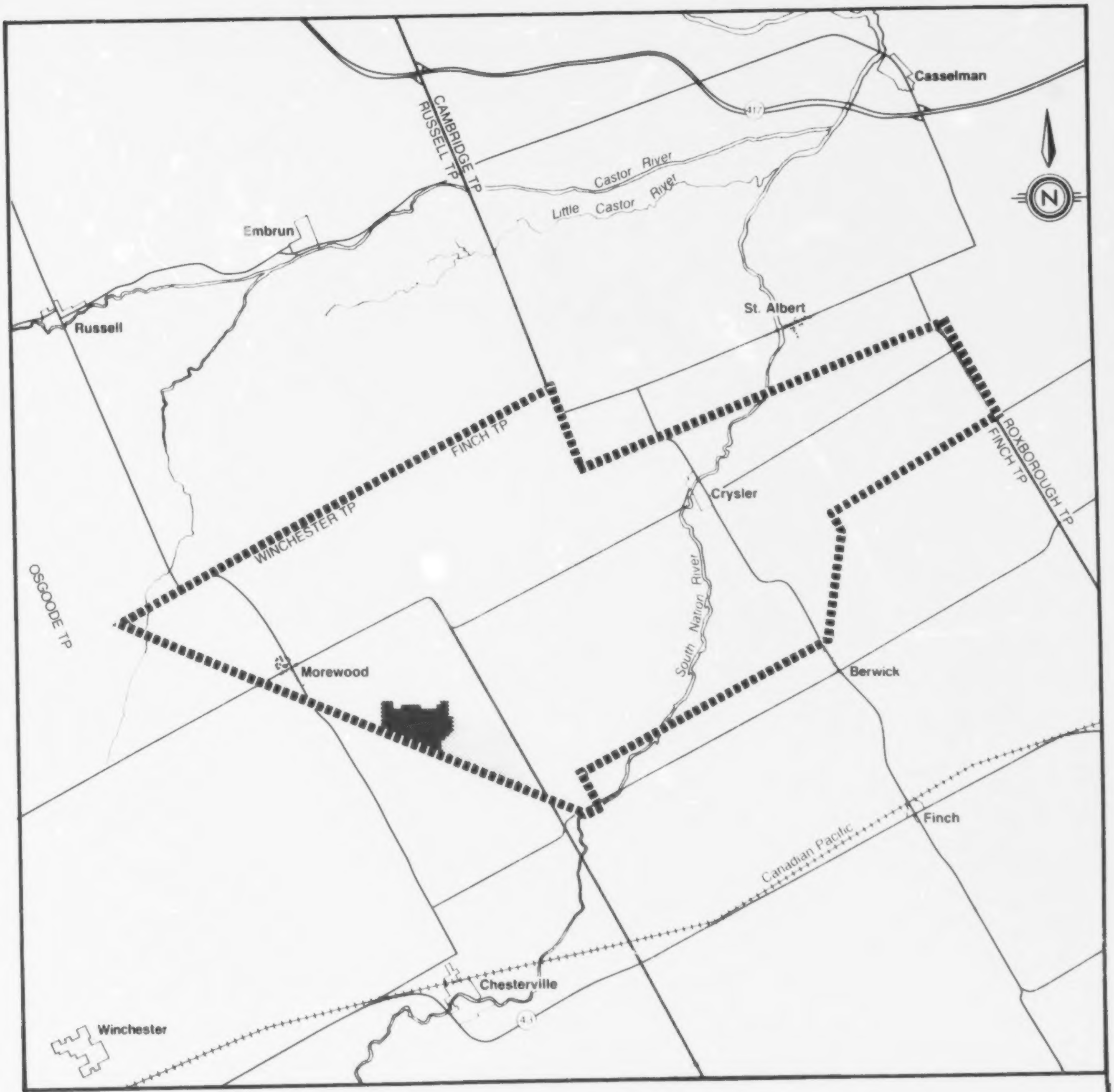
Legend

▪▪▪▪▪▪ Study Area Boundary

■ Medium Constraint

▨ Low Constraint

☐ No Known Constraint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Winchester/Finch Study Area

Biological Resources

Legend

▪▪▪▪▪▪▪ Study Area Boundary

■ High Constraint

☐ Low Constraint

☐ No Known Constraint

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres

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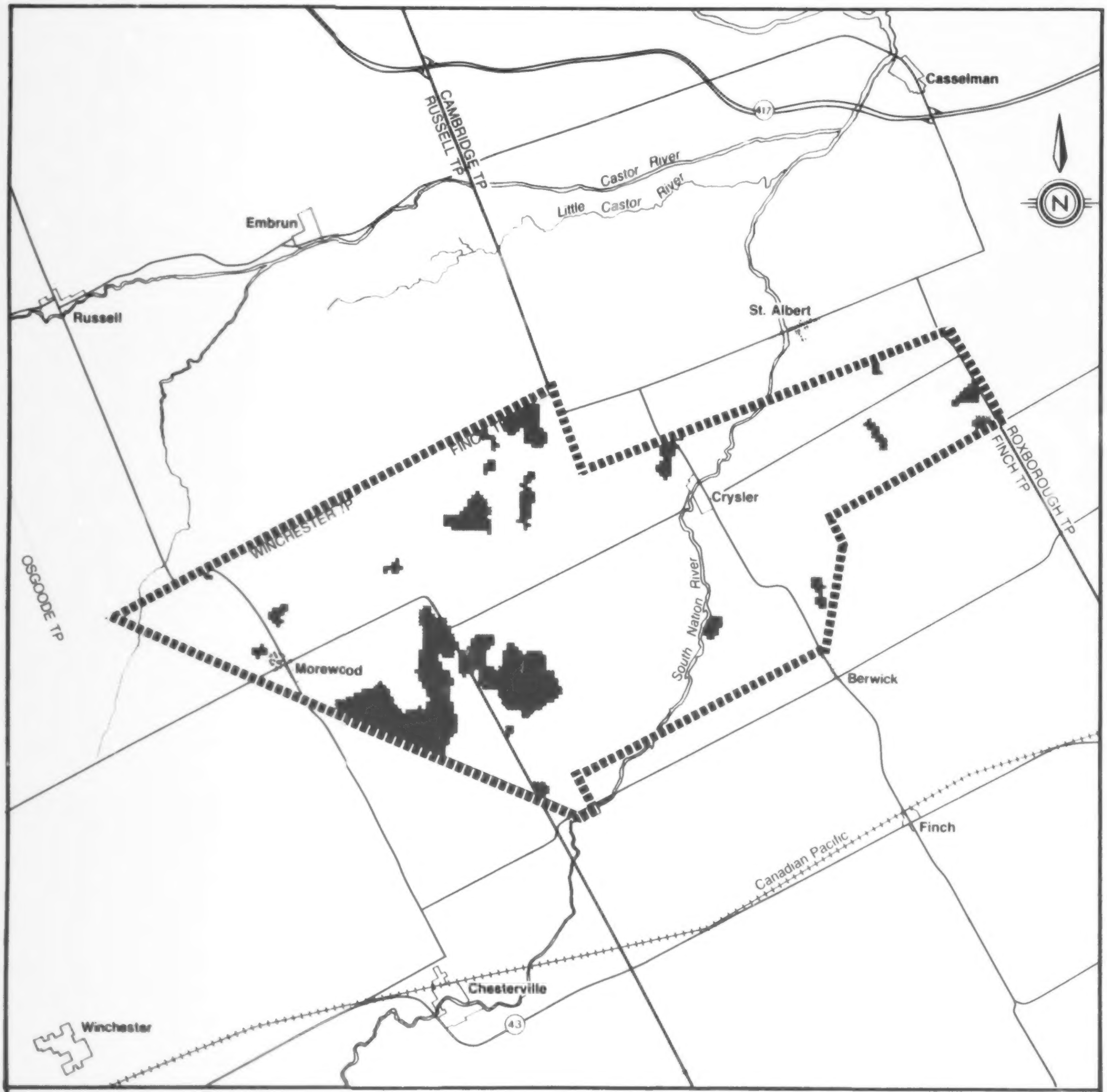
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Canadian Pacific
Chesterville
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Winchester

Winchester/Finch Study Area

Forest Resources

Legend

▪▪▪▪▪▪ Study Area Boundary

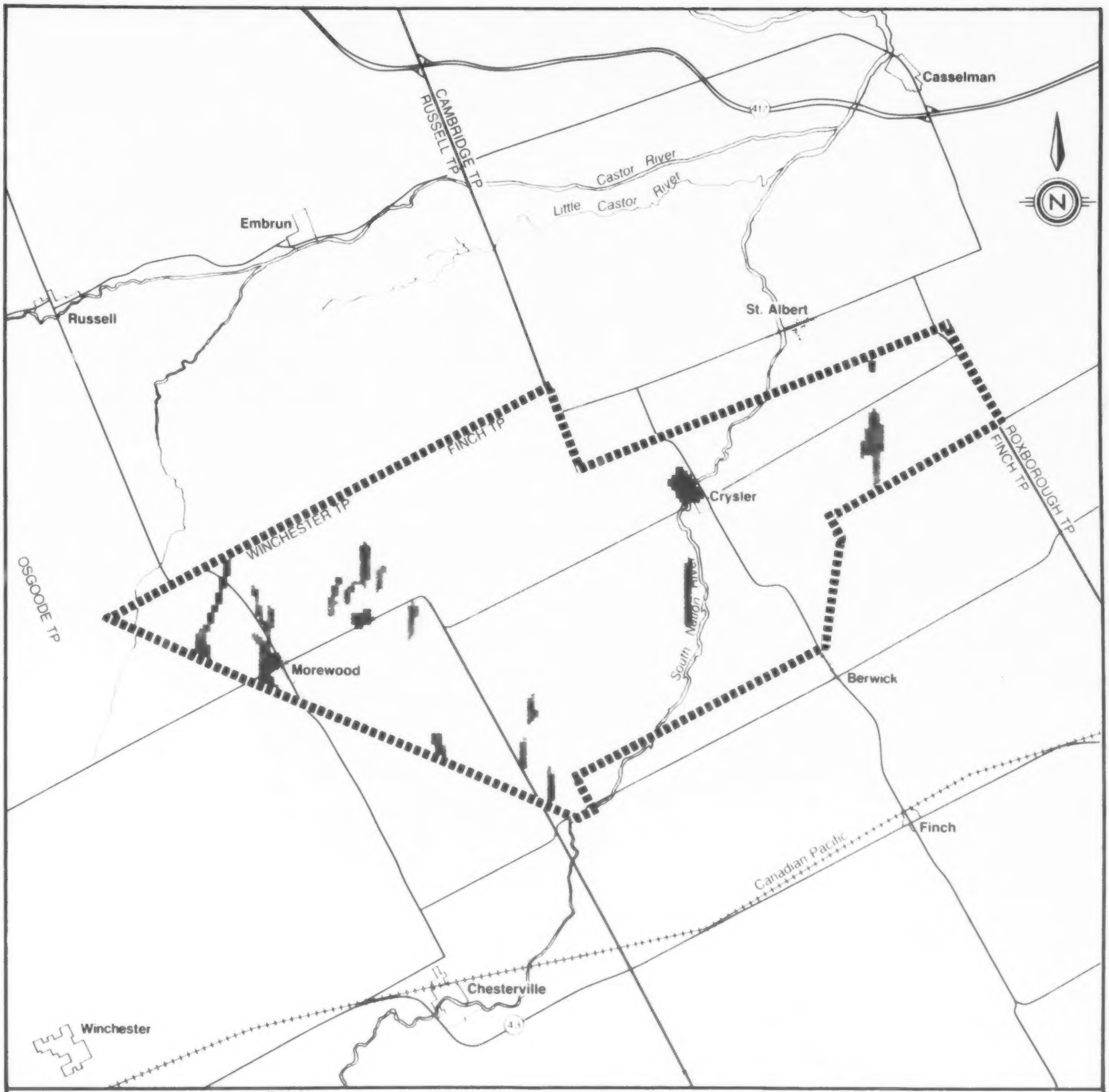
■ High Constraint

■ Medium Constraint

☐ No Known Constraint

1 0 1 2 3 Miles

1 0 1 2 3 4 Kilometres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Chesterville
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Winchester

Winchester/Finch Study Area

Heritage Resources

Legend

▪▪▪▪▪▪ Study Area Boundary

■ High Constraint

▨ Medium Constraint

☐ No Known Constraint

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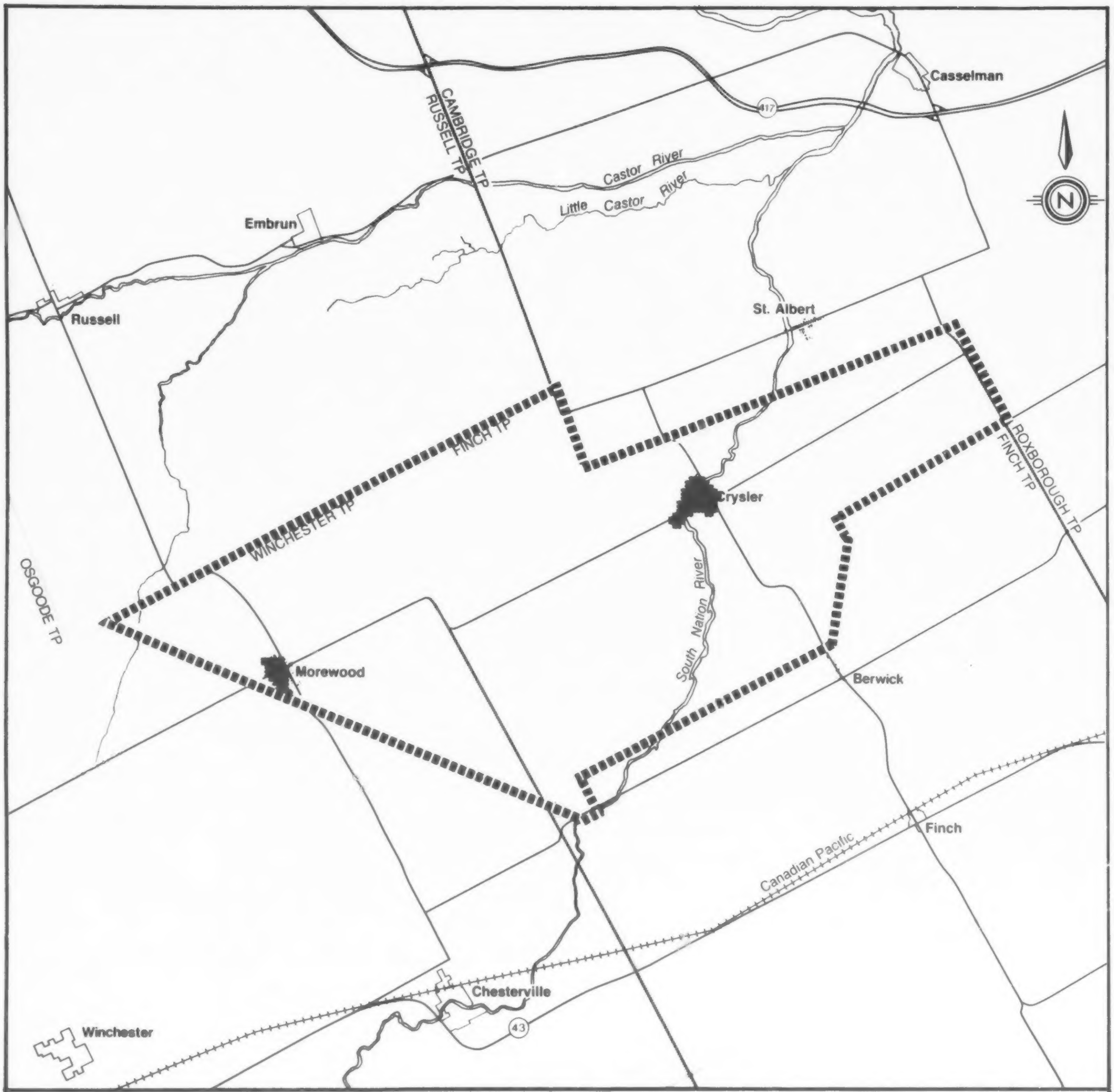
1 0 1 2 3 4 Kilometres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OSGOODE TP
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Berwick
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Canadian Pacific
Chesterville
43
Winchester

Winchester/Finch Study Area

Human Settlement

Legend

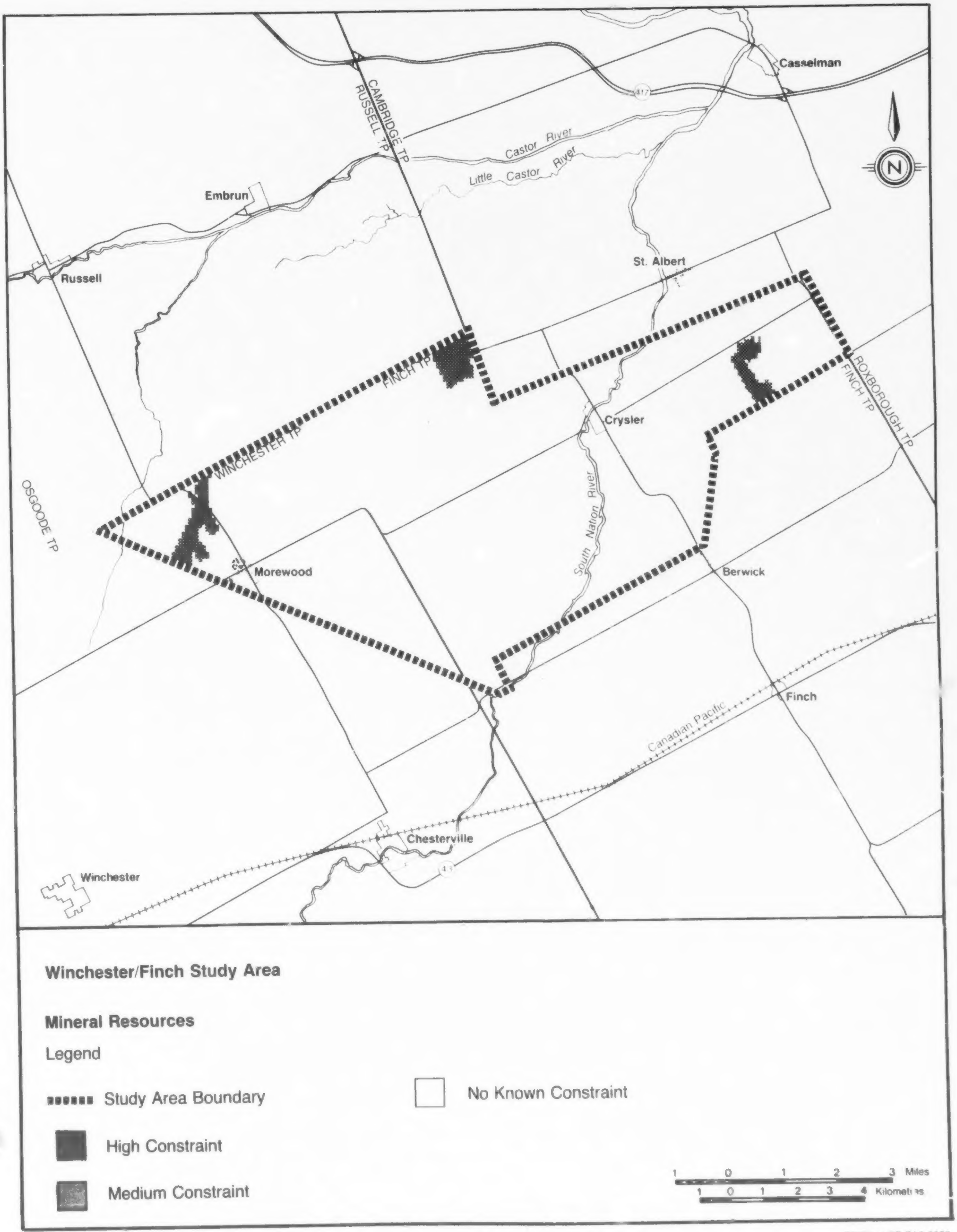
▪▪▪▪▪ Study Area Boundary

☐ No Known Constraint

■ High Constraint

■ Medium Constraint

1 0 1 2 3 Miles
1 0 1 2 3 4 Kilometres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Canadian Pacific
Chesterville
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Winchester
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1 0 1 2 3 Miles
1 0 1 2 3 4 Kilometres

Winchester/Finch Study Area

Mineral Resources

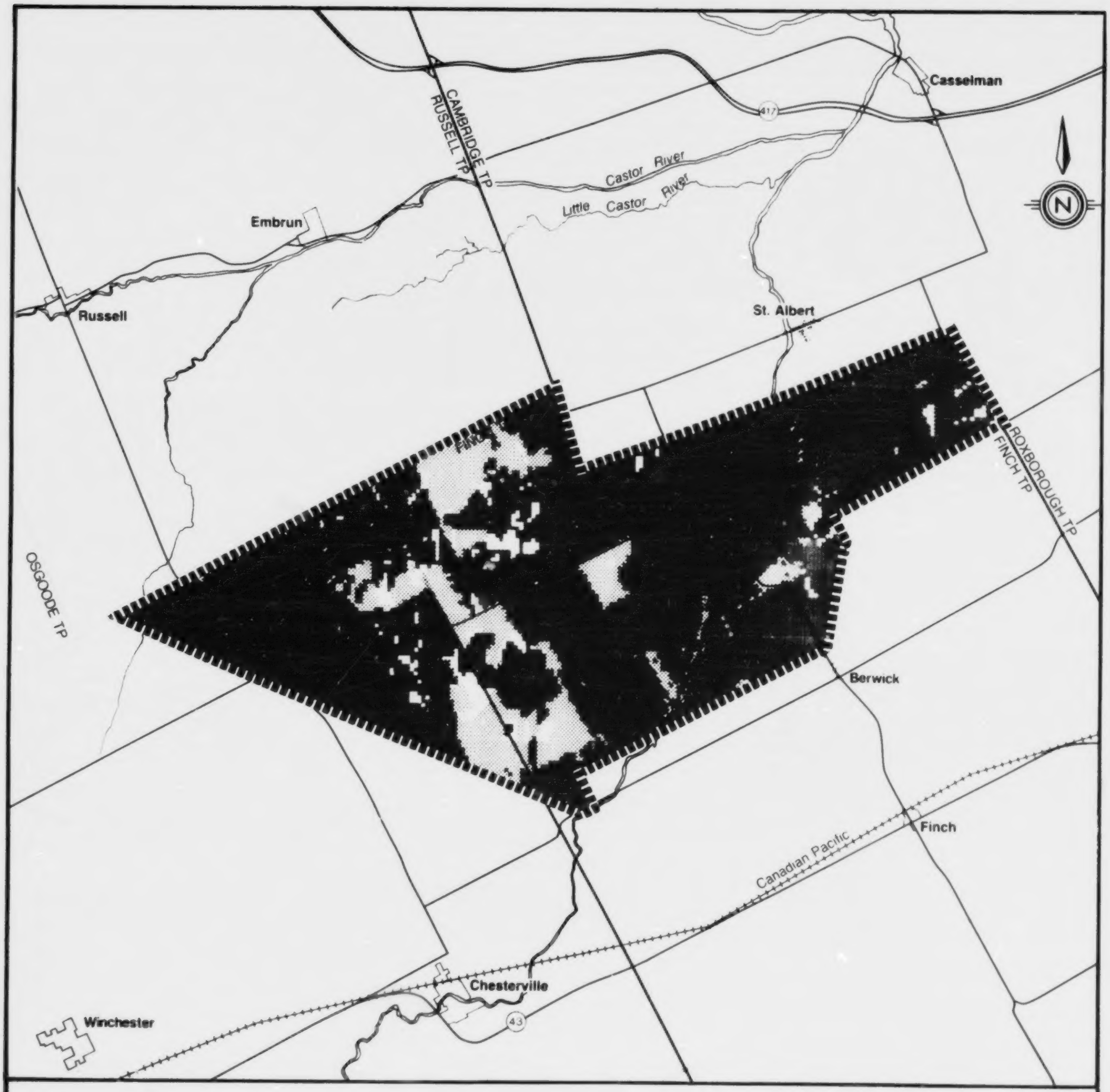
Legend

▪▪▪▪▪▪ Study Area Boundary

■ High Constraint

▨ Medium Constraint

☐ No Known Constraint


Casselman
417
CAMBRIDGE TP
RUSSELL TP
Castor River
Little Castor River
Embrun
Russell
St. Albert
N
ROXBOROUGH TP
FINCH TP
OSGOODE TP
Berwick
Finch
Canadian Pacific
Chesterville
43
Winchester

Winchester/Finch Study Area

Composite Environmental Constraint Map

Legend

▪▪▪▪▪▪▪ Study Area Boundary

■ High Constraint

▩ Medium Constraint

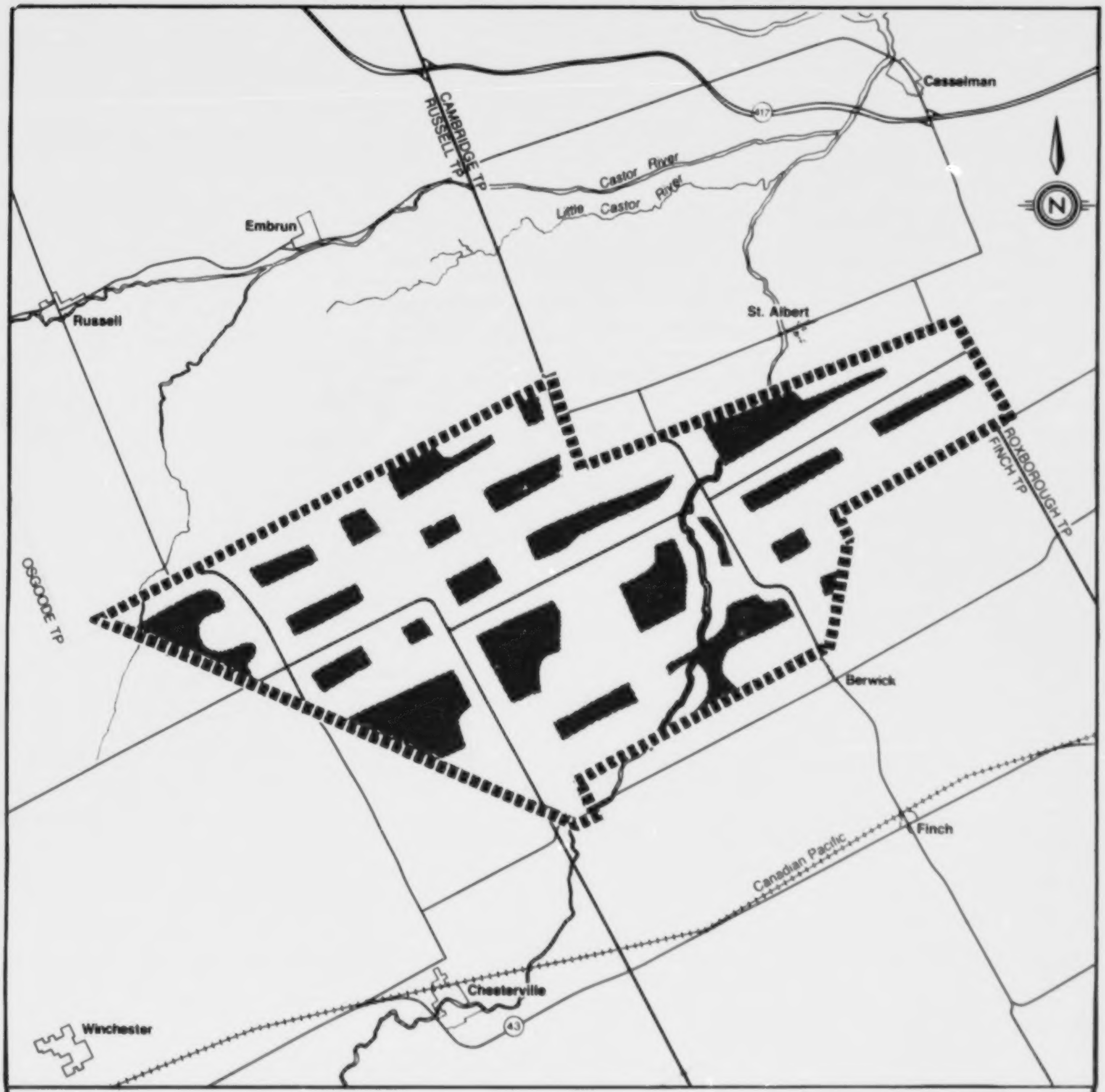
▨ Low Constraint

□ No Known Constraint

1 0 1 2 3 Miles
1 0 1 2 3 4 Kilometres

APPENDIX D6

TECHNICAL CONSTRAINT MAP


Casselman
417
CAMBRIDGE TP
RUSSELL TP
N
Castor River
Little Castor River
Embrun
Russell
St. Albert
ROXBOROUGH TP
FINCH TP
OSGOODE TP
Berwick
Finch
Canadian Pacific
Chesterville
43
Winchester

Winchester Finch Study Area

Technical Constraint Map

Legend

▪▪▪▪▪▪▪ Study Area Boundary

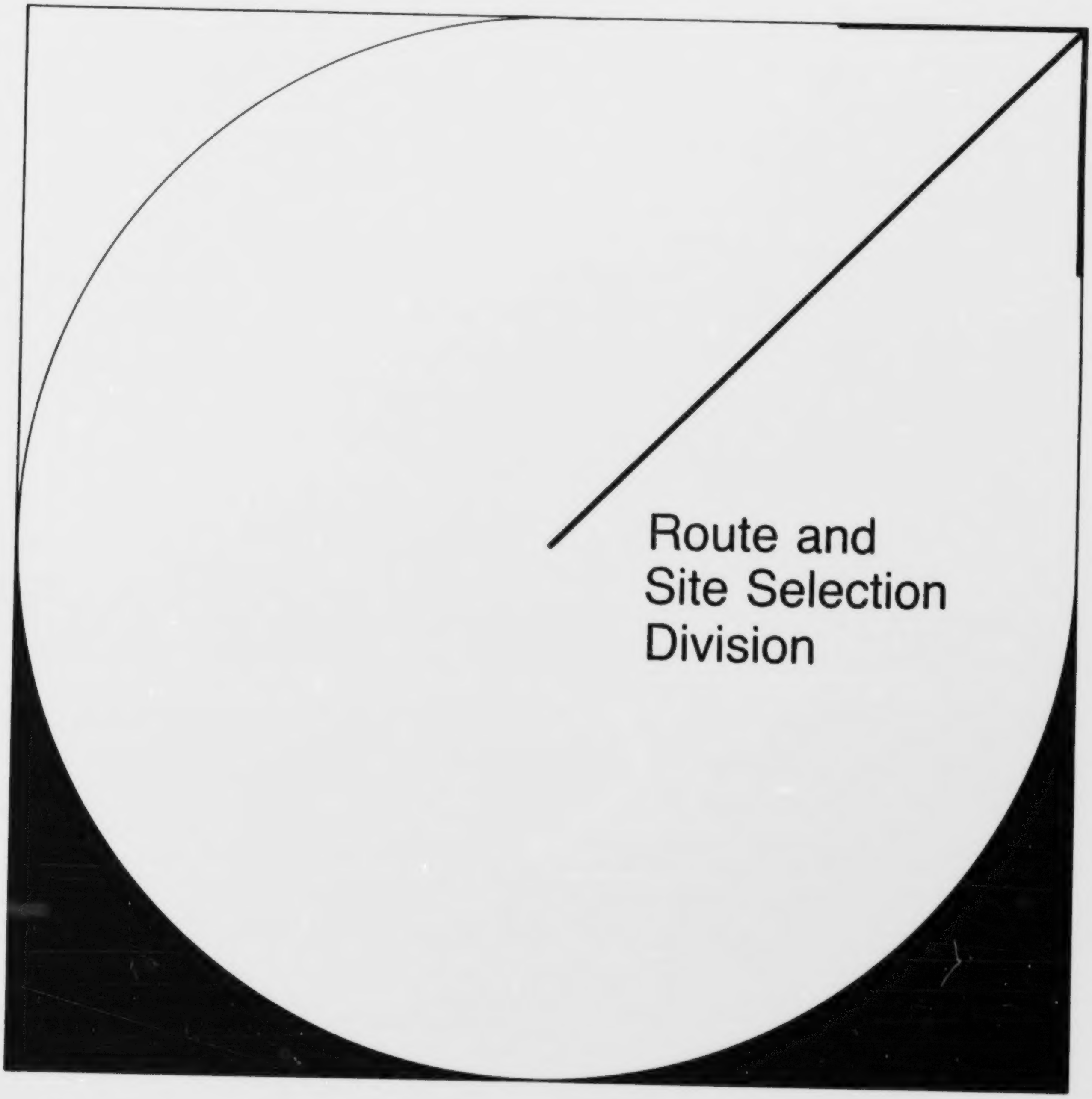
■ High Constraint

1 0 1 2 3 Miles
1 0 1 2 3 4 Kilometres

D7 Site Selection Data Types and Sources

Data Types	Sources
- farms, rural residences, human settlement concentrations	- 1:50,000 National Topographic Series (NTS) maps - field observations
- land use (e.g., agricultural lands, mineral extraction areas)	- East Route Study data file - 1:15,000 air photo mosaics - field observations
- forest cover	- East Route Study data file - 1:15,000 air photo mosaics - field observations
- soil types and productivity	- Soil Survey of Dundas County, Report No. 14, 1952 - Soil Survey of Stormont County, Report No. 20, 1954
- topography (i.e., elevations)	- 1:50,000 NTS - field observations
- municipal planning designations (i.e., land use designations and zoning)	- Official Plan of the Township of Finch, June 1983 - The Corporation of the Township of Finch - Restricted Area By-Law No. 19-80 - Official Plan of the North Dundas Planning Area, November 1975 - The Corporation of the Township of Winchester By-Law No. 27-77

Eastern Ontario Transmission Line Study
Route Stage Environmental Assessment
Summary – Volume I & II



Route and
Site Selection
Division

Eastern Ontario Transmission Line Study

Route Stage Environmental Assessment

Summary - Volume I and II

August, 1984

Report No. 84096

A NOTE TO THE READER

This is a summary of the first two volumes of the Environmental Assessment (EA) which describes the studies and public participation activities carried out to determine the recommended route, and sites for associated telecommunications facilities, for the installation of new bulk transmission facilities in eastern Ontario. The first two volumes of the Environmental Assessment have been submitted to the Joint Board under the Consolidated Hearings Act, 1981. They have also been forwarded to the Minister of the Environment. Volume I deals with the undertaking and the facilities required to supply additional power to eastern Ontario to the year 2000. Volume II describes the locational studies for the West Section (Kingston to Ottawa). A third volume, which deals with the locational studies for the East Section (Cornwall to Ottawa) of the study, will be submitted upon completion of the study in early 1985.

Copies of the first two volumes of the Environmental Assessment have been sent to public libraries and municipal offices within the study area, together with large scale maps (1:15,000) for the local area. Copies of transcripts, exhibits and other hearing record documents will also be made available at selected libraries. These locations are set out in Appendix A of this Summary.

A copy of the Environmental Assessment is also available for reference at the Ontario Hydro offices in eastern Ontario listed in Appendix A.

Anyone requiring further information should contact:

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Supervising Project Engineer
Route and Site Selection Division
Ontario Hydro H8 F1
700 University Avenue
Toronto, Ontario
M5G 1X6
Telephone: (416) 492-4830

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Mr. P.H. Wong
Senior Community Relations Officer
Route and Site Selection Division
Ontario Hydro H8 E6
700 University Avenue
Toronto, Ontario
M5G 1X6
Telephone: (416) 592-3953

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1.0 INTRODUCTION

Volume I
Chapter 1.0

The Environmental Assessment (EA) Report for the Route Stage consists of three volumes.

Volume I - covers those aspects of the study which are common to both the proposed transmission lines and telecommunications facilities between Lennox Generating Station (GS) and Hawthorne Transformer Station (TS), and the transmission line and telecommunications facilities between St. Lawrence TS and Hawthorne TS. It also includes a description of the undertaking, an update of the need for the proposed facilities, an update on alternatives and a description of the proposed facilities.

Volume II - describes the study to select the recommended route for two single circuit 500 kilovolt (kV) lines from Lennox GS to Hawthorne TS and sites for associated telecommunications facilities (West Section).

Volume III - will describe the study to select the recommended route for one single circuit 500 kV line from St. Lawrence TS to Hawthorne TS and sites for associated telecommunications facilities (East Section). This volume will be available in early 1985.

This document summarizes the first two volumes of the EA. A summary of Volume III will be available in early 1985.

1.1 Plan Stage

Plan Stage studies were undertaken to determine the most acceptable plan for the supply of electrical energy in eastern Ontario and to allow exchanges of up to 2000 megawatts (MW) with Hydro-Quebec. A number of alternatives were identified and evaluated. A recommended plan was selected and submitted for review and approval under the Environmental Assessment Act in July, 1980, and subsequently for approval under The Consolidated Hearings Act, 1981, in August 1981.

Public hearings under the Consolidated Hearings Act were held in January, May, and June, 1982 before the Joint Board. These hearings, held mostly in Ottawa, examined the need for the new facilities, alternative ways to meet the need and Ontario Hydro's recommended

Line Numbers

Main Report Reference

plan. On September 28, 1982, the Joint Board issued its decision approving the alternative system plan designated as Plan M3 (refer to Figures 1.1 and 1.2).

1.3 Route Stage

Following the Joint Board's decision, Ontario Hydro initiated studies to select acceptable routes and microwave radio station sites. These studies were conducted in conjunction with a programme of public involvement and were divided into two segments - the West Section (Kingston to Ottawa) and the East Section (Cornwall to Ottawa and the Hydro Quebec interconnection). Figure 1.3 outlines the basic steps followed in this study.

1.4 Interconnection with Hydro-Quebec

Ontario Hydro's original application included a 2000 MW interconnection with Hydro-Quebec.

In April 1984, Ontario Hydro decided to seek the removal of the interconnection from the application. This was in response to the growing urgency in the need for new transmission to ensure reliable power supply to the Ottawa area and further concern as to the date of completion of the interconnection assessment. The Joint Board heard Ontario Hydro's evidence on this request at hearings in May and June, 1984 and granted approval to remove the interconnection from the application on June 29, 1984.

1.5 Deferral of East Section

The Joint Board also approved in their decision of June 29, 1984, the deferral of all hearings on the approval of the location for the East Section (Cornwall to Ottawa) facilities. It is anticipated that this hearing will be held in the summer of 1985. General issues affecting the East Section will, however, be addressed at a public hearing to begin with a preliminary hearing in the fall of 1984.

2.0 PURPOSE OF THE UNDERTAKING

Volume I
Chapter 2.0

The general purpose of the undertaking is to continue to provide a reliable supply of electric power and energy to the people of Ontario at the lowest feasible cost consistent with employee and public safety, taking into account the social, environmental and economic aspirations of the people of Ontario.

Consistent with the above, the specific purpose of the undertaking is to provide for the supply of electric power and energy to meet the load growth now forecast to occur in eastern Ontario to the year 2000.

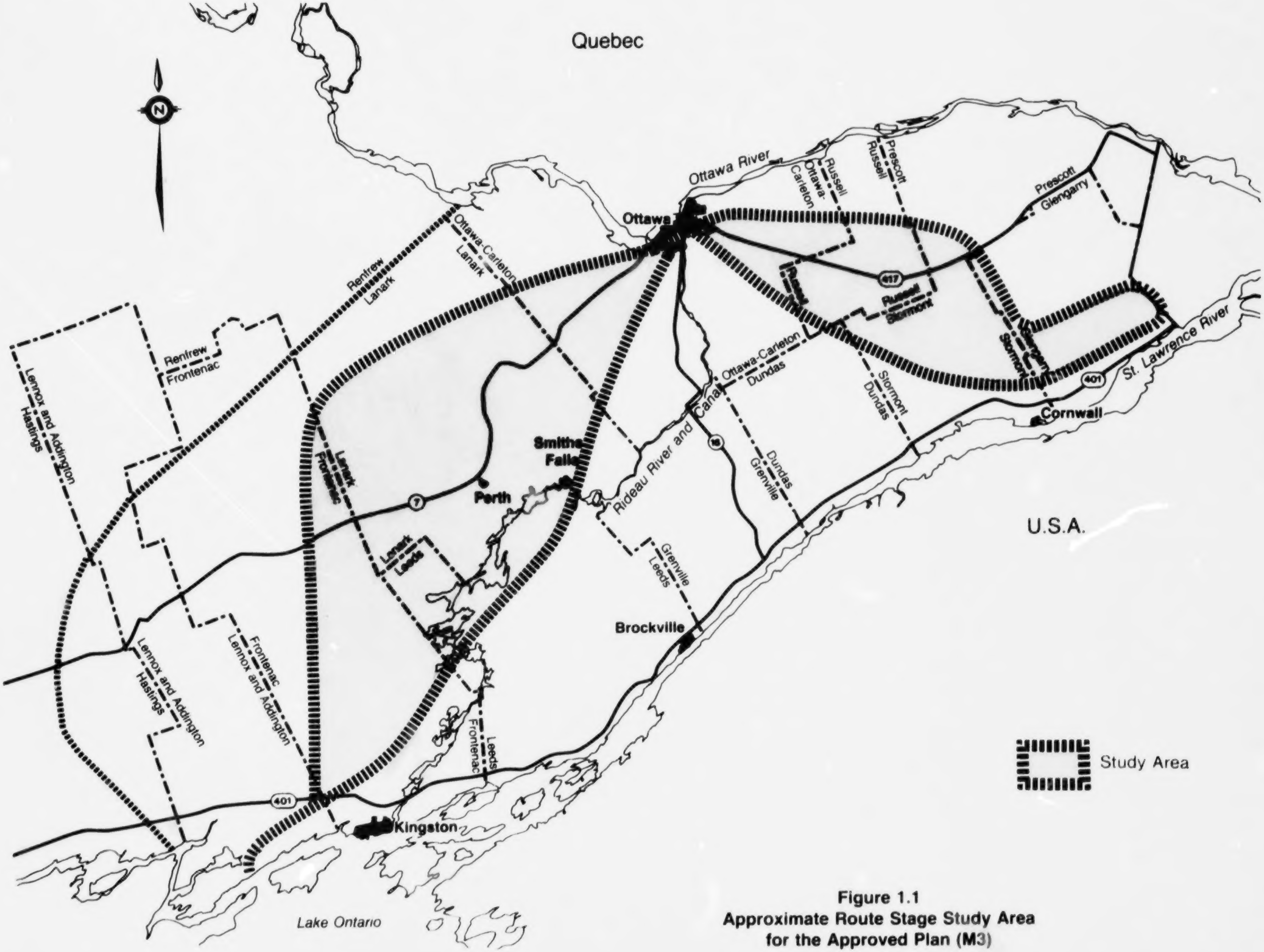
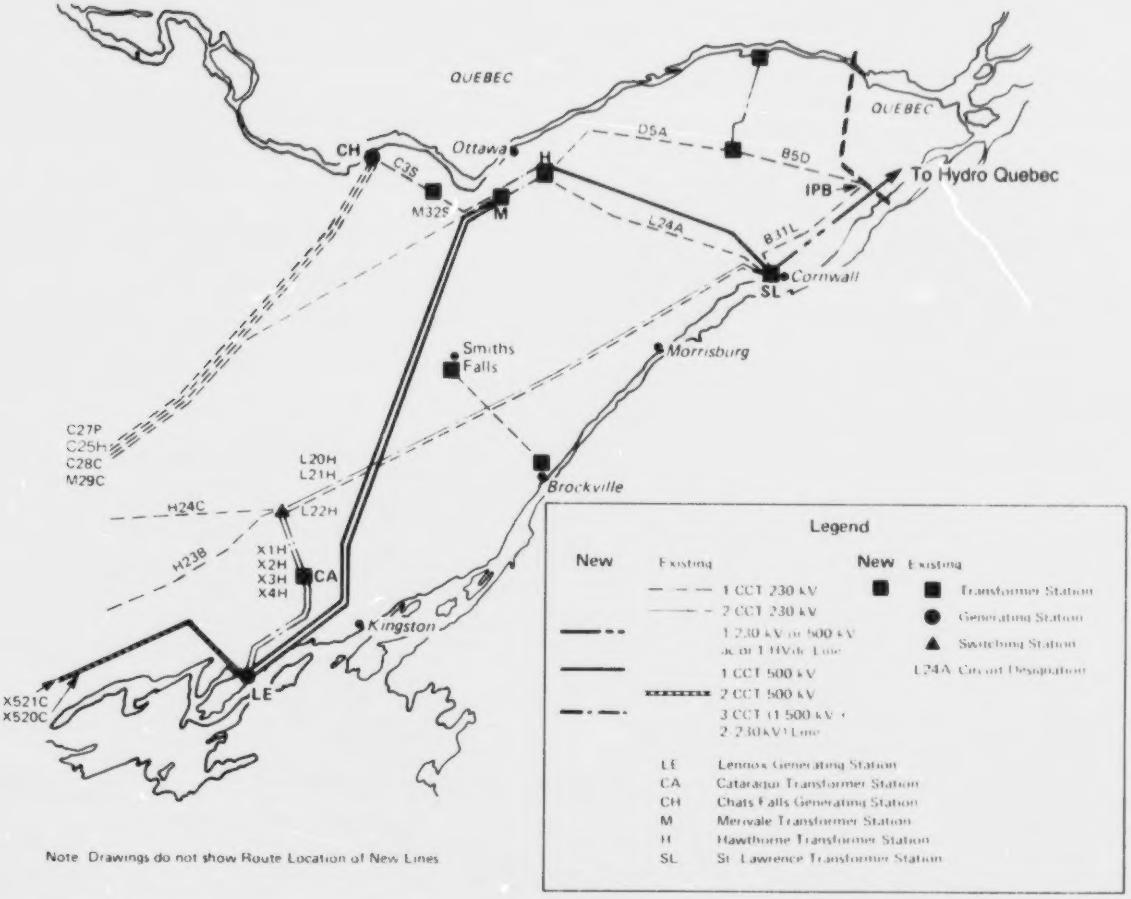

Quebec
U.S.A.
Ottawa River
Ottawa
St. Lawrence River
Cornwall
Brockville
Kingston
Smiths Falls
Perth
Rideau River and Canal
Lake Ontario
401
417
16
7
Renfrew
Lanark
Ottawa-Carleton
Lanark
Renfrew
Frontenac
Lennox and Addington
Hastings
Lanark
Frontenac
Lanark
Leeds
Frontenac
Lennox and Addington
Lennox and Addington
Hastings
Leeds
Frontenac
Grenville
Leeds
Dundas
Grenville
Ottawa-Carleton
Dundas
Stormont
Dundas
Russell
Ottawa-Carleton
Prescott
Russell
Russell
Russell
Stormont
Prescott
Glengarry
Stormont
Glengarry
Study Area

Figure 1.1
Approximate Route Stage Study Area
for the Approved Plan (M3)


QUEBEC
QUEBEC
Ottawa
CH
C3S
M32S
M
H
D5A
B5D
IPB
To Hydro Quebec
L24A
B31L
Cornwall
SL
Smiths Falls
Morrisburg
C27P
C25H
C28C
M29C
L20H
L21H
L22H
H24C
H23B
X1H
X2H
X3H
X4H
CA
Brockville
Kingston
LE
X521C
X520C
Legend
New
Existing
1 CCT 230 kV
2 CCT 230 kV
1 230 kV or 500 kV ac or 1 HVdc Line
1 CCT 500 kV
2 CCT 500 kV
3 CCT (1 500 kV + 2 230 kV) Line
New
Existing
Transformer Station
Generating Station
Switching Station
L24A Circuit Designation
LE Lennox Generating Station
CA Cataraqui Transformer Station
CH Chats Falls Generating Station
M Merivale Transformer Station
H Hawthorne Transformer Station
SL St. Lawrence Transformer Station

Note: Drawings do not show Route Location of New Lines.

The approved plan (2000 stage) illustrated above comprises the following:

A) STATIONS

1) Lennox GS	– 500 kV switching facilities.
2) Hawthorne TS	– A 500 230 kV switching and transformer station in the Ottawa area at the existing Hawthorne TS site.
3) Merivale TS	– Provision for a 500 230 kV switching and transformer station in the Ottawa area at the existing Merivale TS site.
4) St. Lawrence TS	– A 500 230 kV switching and transformer station in the Cornwall area at the existing St. Lawrence TS site.
5) Other	– An extension of the Ontario Hydro microwave communication system linking stations in eastern Ontario.

B) LINES

1) Lennox GS to Merivale TS	– Two single-circuit 500 kV lines.
2) Merivale TS to Hawthorne	– The minimum requirements for this link are: - Two 500 kV circuits on separate tower lines. - Four 230 kV circuits. Except for some short sections, these requirements can be accommodated on the existing right of way by removing the existing circuits and installing two three-circuit tower lines, each with one 500 kV circuit and two 230 kV circuits. If in the route stage it is determined that the right of way can be widened, other arrangements may be considered.
3) Hawthorne TS to St. Lawrence TS	– One single-circuit 500 kV line.

Figure 1.2
The Approved Plan (M3)

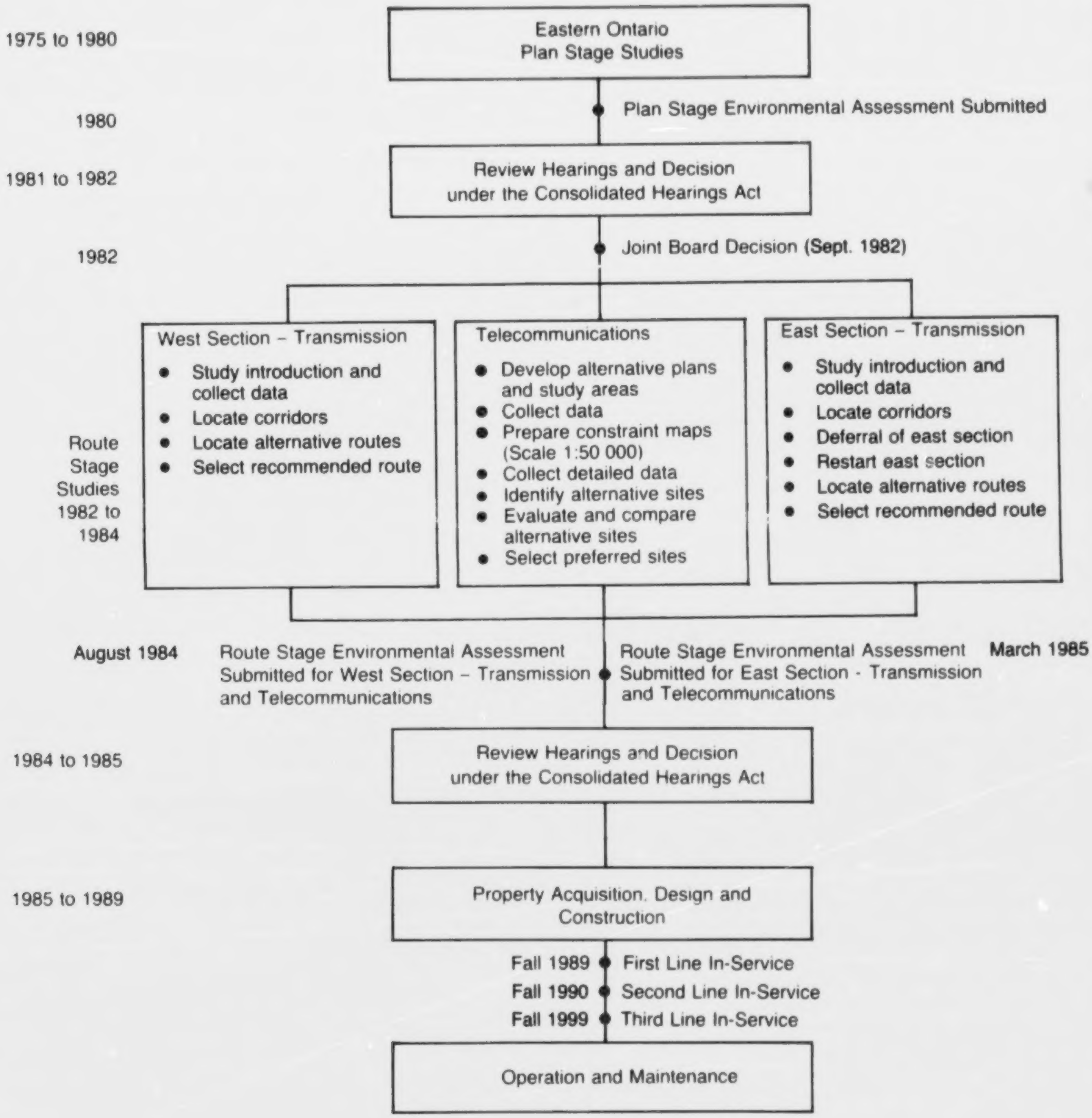

1975 to 1980
Eastern Ontario
Plan Stage Studies
1980
Plan Stage Environmental Assessment Submitted
1981 to 1982
Review Hearings and Decision
under the Consolidated Hearings Act
1982
Joint Board Decision (Sept. 1982)
Route Stage Studies 1982 to 1984
West Section – Transmission
Study introduction and collect data
Locate corridors
Locate alternative routes
Select recommended route
Telecommunications
Develop alternative plans and study areas
Collect data
Prepare constraint maps (Scale 1:50 000)
Collect detailed data
Identify alternative sites
Evaluate and compare alternative sites
Select preferred sites
East Section – Transmission
Study introduction and collect data
Locate corridors
Deferral of east section
Restart east section
Locate alternative routes
Select recommended route
August 1984
Route Stage Environmental Assessment Submitted for West Section – Transmission and Telecommunications
Route Stage Environmental Assessment Submitted for East Section - Transmission and Telecommunications
March 1985
1984 to 1985
Review Hearings and Decision
under the Consolidated Hearings Act
1985 to 1989
Property Acquisition. Design and Construction
Fall 1989
First Line In-Service
Fall 1990
Second Line In-Service
Fall 1999
Third Line In-Service
Operation and Maintenance

Figure 1.3
Project Life Cycle of Eastern Ontario Plan and Route Stage Studies

RS-164-LUEP-RA6-0046

Main Report Reference

3.0 THE UNDERTAKING

Volume I Chapter 3.0

The undertaking, for which approval is requested pursuant to the Plan Stage approval granted by the Joint Board in its decision, dated August 6, 1982, is a transmission system project consisting of the planning of, the selection of locations for, the acquisition of property rights for, and the design, construction, operation and maintenance of additional bulk electricity system facilities in eastern Ontario, consisting of switching and transformer stations, telecommunications and control facilities, transmission lines and related facilities.

The purpose of the undertaking can be fulfilled by various alternative transmission line routes and microwave radio station sites.

The alternative route and sites preferred by Ontario Hydro for the West Section and recommended for approval are shown on Figure 3.1 and described in Sections 10.3.2 and 10.3.3.

The alternative route and sites preferred by Ontario Hydro for the East Section and recommended for approval will be set out in Volume III to be submitted in early 1985.

4.0 LOAD GROWTH

Volume I Chapter 4.0

Although the transmission facilities in Plan M3 are required to support the load in all of eastern Ontario, their timing is directly related to the load growth in the Ottawa area.

The eastern Ontario study area can be roughly described as the area east of a north-south line through Lennox GS near Kingston. The Ottawa area load includes that of the Regional Municipality of Ottawa - Carleton and others as far west as Almonte and Arnprior and as far east as Hawkesbury.

Historically, the eastern Ontario study area and the Ottawa area in particular have had higher rates of electrical load growth than Ontario as a whole. This trend which is expected to continue during the study period, can be attributed partly to the fact that Ottawa is the nation's capital, partly to the growth in "high-tech" industries in the Ottawa Valley, and partly to local acceptance of government programmes and incentives designed to promote development, such as the Ontario Government BILD programme, and the Federal Government oil substitution (COSP) programme.

Figure 4.1 shows the forecast January peak loads for the Ottawa area. Based on the 1984 load forecast, the electrical load in the Ottawa area is expected to grow at an average rate of 3.1% to the year 2000. Also shown in Figure 4.1 are the actual peak loads in the 1981 to 1984 period and the 1982 forecast presented at the Plan Stage hearings. As

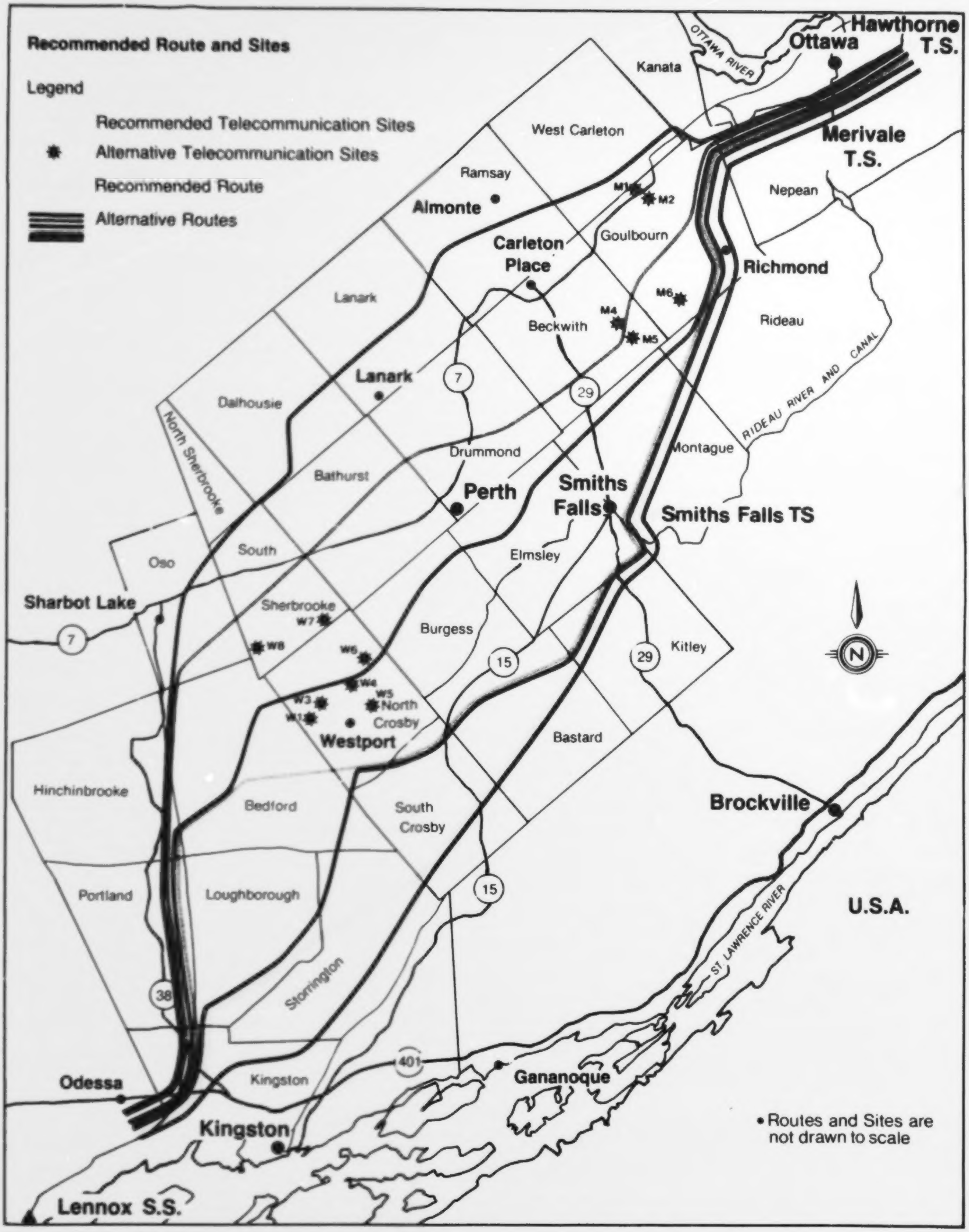

Recommended Route and Sites
Legend
Recommended Telecommunication Sites
Alternative Telecommunication Sites
Recommended Route
Alternative Routes
Hawthorne T.S.
Ottawa
OTTAWA RIVER
Kanata
West Carleton
Merivale T.S.
Ramsay
Almonte
Nepean
M1
M2
Goulbourn
Carleton Place
Richmond
M6
M4
M5
Beckwith
Rideau
Lanark
Lanark
7
29
Dalhousie
RIDEAU RIVER AND CANAL
North Sherbrooke
Drummond
Montague
Bathurst
Perth
Smiths Falls
Smiths Falls TS
Oso
South
Elmsley
Sharbot Lake
Sherbrooke
W7
W8
Burgess
7
W6
15
29
Kitley
N
W4
W3
W5
W1
North Crosby
Westport
Bastard
Hinchinbrooke
Bedford
South Crosby
Brockville
Portland
Loughborough
15
U.S.A.
ST. LAWRENCE RIVER
Storrington
38
401
Odessa
Kingston
Gananoque
Kingston
Lennox S.S.
• Routes and Sites are not drawn to scale

Figure 3.1

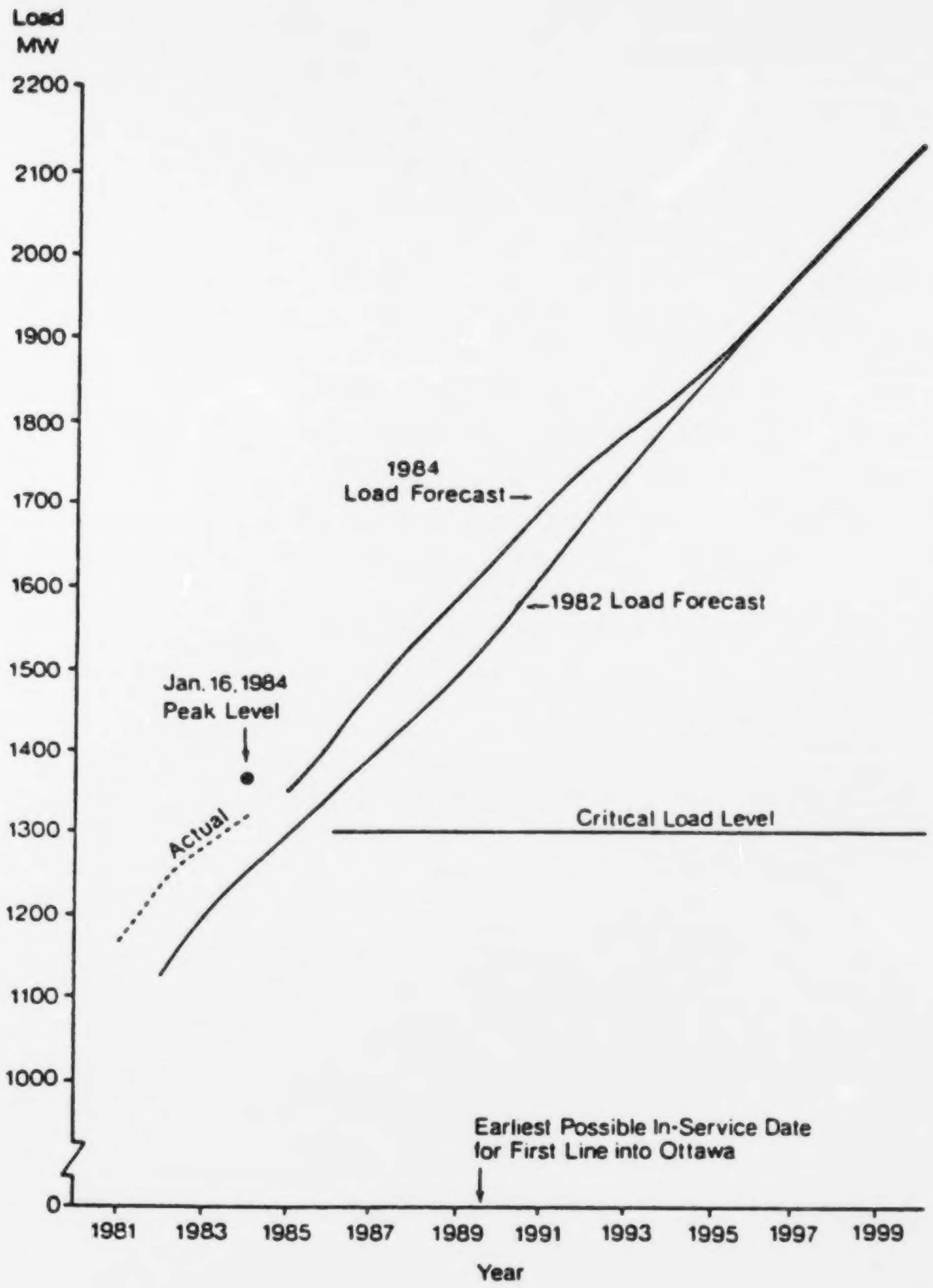


Figure 4.1
Ottawa Area Peak Loads

illustrated, the actual peak load has been significantly higher than forecast. As well, the 1984 forecast of loads for the late 1980s to mid-1990s period is higher than the 1982 forecast.

As noted in Figure 4.1 the actual 1983/84 winter peak load in Ottawa was 1359 MW. Previously, the peak loads for the area were measured at the time of the peak load for the entire province. Recent improvements in data collection have made it possible to determine the Ottawa area peak load independent of the rest of the power system. As the Ottawa area peak load could have occurred non-coincident with the Eastern Region peak load in earlier years, demand in the Ottawa area may have been higher than the "actual" loads illustrated on that figure.

5.0 SYSTEM REQUIREMENTS

Volume I
Sections 5.1
and 5.2

5.1 Transmission

The design criteria for the Ottawa area is based on the overlapping loss of the two most critical transmission lines supplying this area. For this situation acceptable voltages and circuit loading conditions must be maintained without the loss of customer load. Based on this criteria, the existing system is capable of reliably delivering approximately 1,300 MW of power to the Ottawa area.

The supply to the Ottawa area is now critical. However, if this problem is not corrected, eventually the supply to Smiths Falls, Perth, Brockville and the St. Lawrence area generally, will also be in jeopardy. If no additional facilities are in service by the early to mid-1990s, the critical load area would extend over nearly all of the eastern Ontario study area.

The timing of the new 500 kV transmission facilities associated with the approved Plan M3 is directly related to the requirement to supply the load in the Ottawa area, as described in Section 4.0. Based on the present load forecast, the three lines would be placed in service in 1989, 1990 and 1999.

It is essential that the first circuit to Hawthorne TS be from Lennox GS in order to connect the Ottawa area to the main Ontario bulk electric system west of Kingston.

The staging of the second and third 500 kV lines to Hawthorne TS, could be influenced by the outcome of the technical study on the interconnection with Hydro-Quebec. One possible scenario is a recommendation for an interconnection at St. Lawrence TS in the early 1990s. Under this scenario, the second line would be from St. Lawrence TS and the third line would be from Lennox GS. On the other hand, if there is to be no interconnection within the study period, the second line would be from either St. Lawrence TS or Lennox GS depending upon other factors.

Line Numbers

Main Report Reference

If the second line is from St. Lawrence TS, the total cost of Plan M3 is estimated to be $293,000,000. If it is from Lennox GS, the cost is estimated to be $299,000,000.

5.2 Telecommunications

Volume I Section 5.3

The facilities required for Plan M3 as approved by the Joint Board in its Plan Stage decision, included an expansion of Ontario Hydro's existing microwave telecommunications system into eastern Ontario.

Telecommunications facilities are required to effectively protect and control the bulk electricity system. The prime function of the telecommunications facilities is to provide high-speed isolation of faulted elements of this system. They are also used for remote control of stations, for automatic control of generators and for acquisition of data.

As illustrated in Figure 5.1, the existing microwave radio telecommunications system extends eastward as far as the Hinchinbrooke Switching Station (SS). The proposed telecommunications system will require three microwave radio repeater stations between Hinchinbrooke SS and Hawthorne TS and one between Hawthorne TS and St. Lawrence TS, and terminal facilities at Hawthorne TS and St. Lawrence TS. Telecommunications facilities are required when the transmission lines go in service.

6.0 ALTERNATIVES

Volume I Chapter 6.0

Ontario Hydro is continually studying alternatives in supplying the electrical needs of its customers. Alternatives to this undertaking were discussed in Section 10.0 of the Plan Stage Environmental Assessment and were set out in evidence before the Joint Board.

The Joint Board in their September 28, 1982 Reasons for Decision accepted Ontario Hydro's recommendation in the Plan Stage that additional bulk transmission facilities are the best alternative to satisfy the purposes of the undertaking. Since the Plan Stage hearings, there have been no significant developments which would alter that conclusion.

The route stage studies determined alternative locations for the required transmission facilities and alternatives for the required microwave radio telecommunications system.

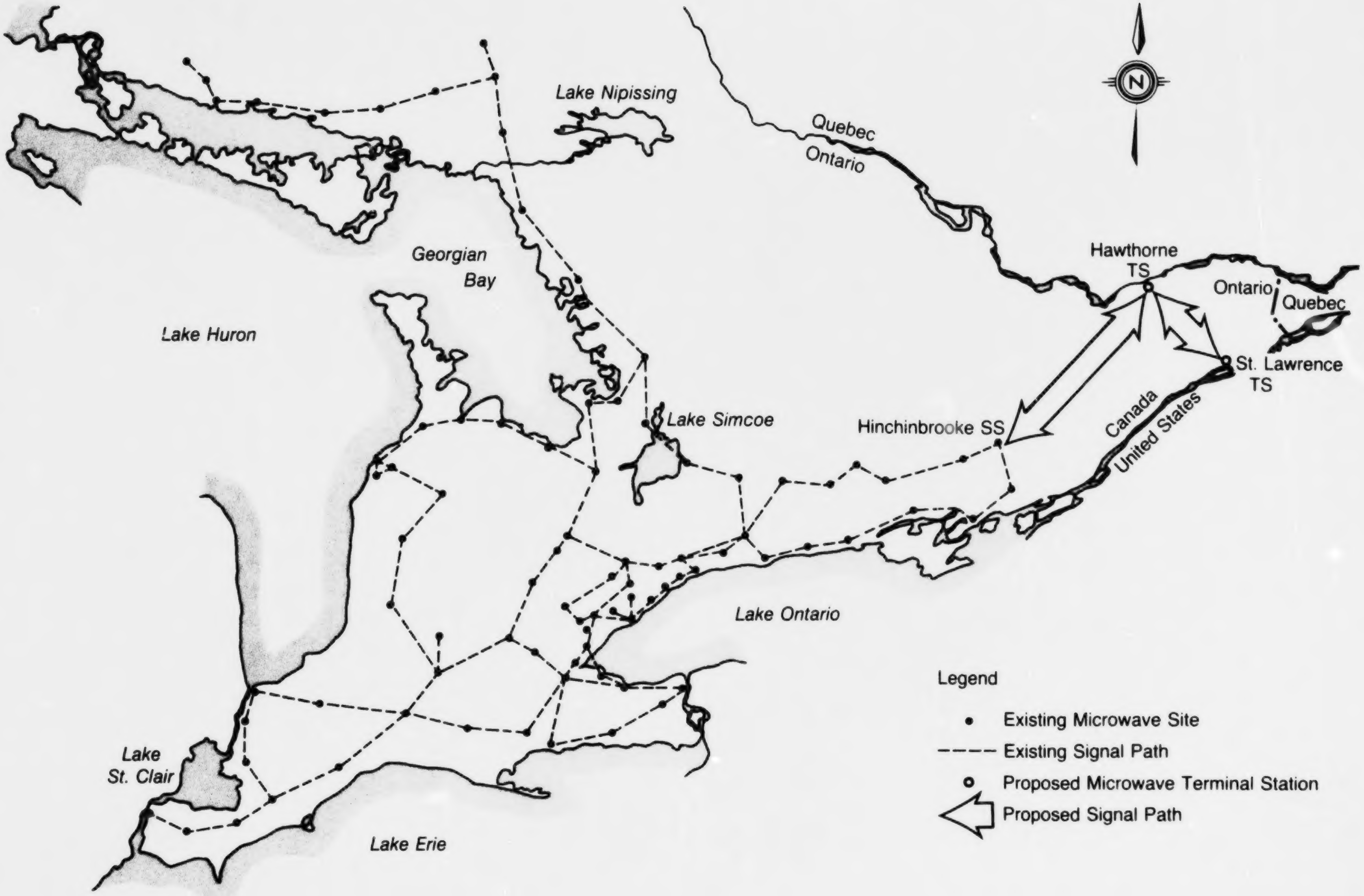

Lake Nipissing
Quebec
Ontario
Hawthorne TS
Ontario
Quebec
St. Lawrence TS
Canada
United States
Georgian Bay
Lake Huron
Lake Simcoe
Hinchinbrooke SS
Lake Ontario
Lake St. Clair
Lake Erie
Legend
● Existing Microwave Site
---- Existing Signal Path
○ Proposed Microwave Terminal Station
⇦ Proposed Signal Path

Figure 5.1
Existing and Proposed Telecommunication System

Main Report
Reference

7.0 FACILITIES CONSIDERED

7.1 Lennox GS to Hawthorne TS

Volume I
Section 7.1

Two new single circuit 500 kV transmission lines are required from the switchyard at Lennox GS to Hawthorne TS. The two 500 kV lines will pass through the Merivale TS but no electrical connections at 500 kV will be made at this station in the study period.

Two additional 230 kV circuits will also be needed between Merivale TS and Hawthorne TS.

7.2 Tower Types

Various tower designs were investigated in the study. These are illustrated in Figures 7.1 to 7.7. The specific tower types that will be used will be determined after conducting a detailed analysis.

(a) Conventional Four Footing Lattice Towers

- These towers would be used in most areas in eastern Ontario.

(b) V-guyed Structures

- These towers could be used in areas of rough terrain. They are not considered for agricultural land because the presence of guy-wires could interfere with mechanized farm equipment.

(c) Single footing narrow base towers

Agreement has been reached between Ontario Hydro and the Ontario Federation of Agriculture (OFA) regarding the use of single footing narrow base towers. Subject to technical requirements these towers will be used for straight-line open field crossings of cultivated land having soil capability of Class 1-4 and specialty crop land.

(d) Steel Poles

Fabricated steel pole structures as shown in Figures 7.4 and 7.5 will be considered under special circumstances. It is Ontario Hydro's practice to consider these towers for one or two circuits, where residential, commercial or industrial park areas are established or under construction, or where development plans have been approved.

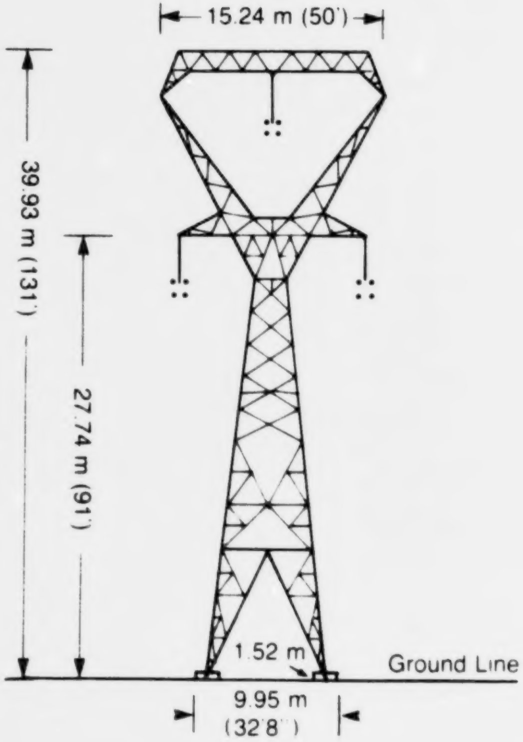

15.24 m (50')
39.93 m (131')
27.74 m (91')
1.52 m
Ground Line
9.95 m
(32'8")

Figure 7.1
500 kV Single Circuit
Conventional Lattice Tower

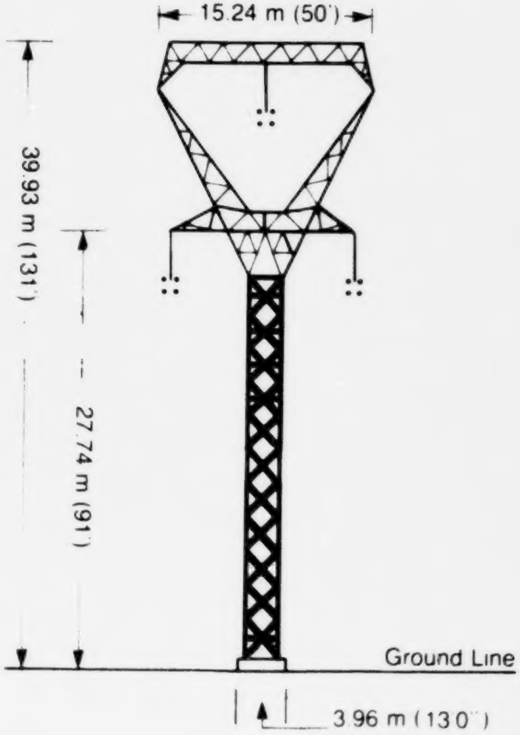

15.24 m (50')
39.93 m (131')
27.74 m (91')
Ground Line
3.96 m (13'0")

Figure 7.2
500 kV Single Circuit
Narrow Base Lattice Tower

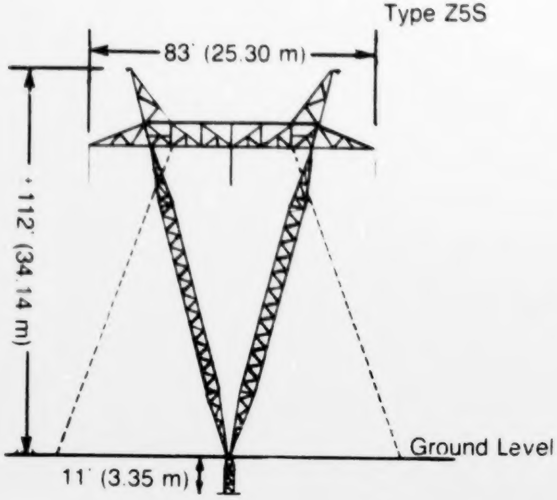

Type Z5S
83' (25.30 m)
112' (34.14 m)
Ground Level
11' (3.35 m)

Figure 7.3
500 kV Single Circuit
"V" Guyed Tower

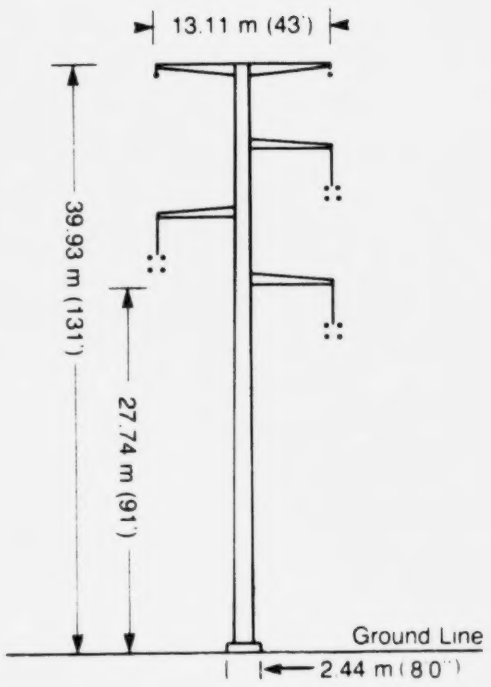

13.11 m (43')
39.93 m (131')
27.74 m (91')
Ground Line
2.44 m (8.0'')

Figure 7.4
500 kV Single Circuit
Steel Pole Tower

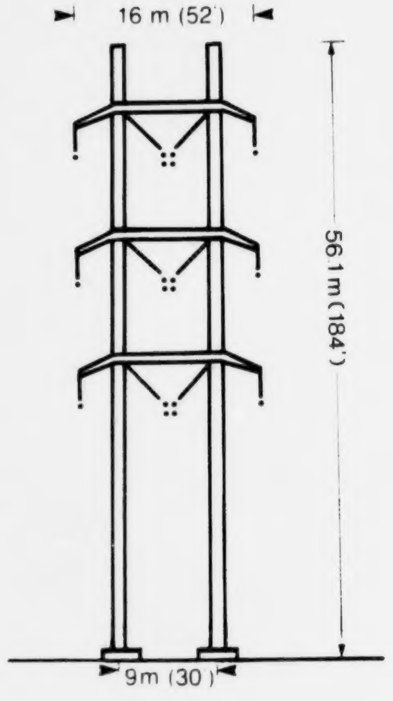

16 m (52')
56.1 m (184')
9m (30')

Figure 7.5
500 kV Single Circuit
230 kV Double Circuit Dual Voltage
Steel Pole Tower

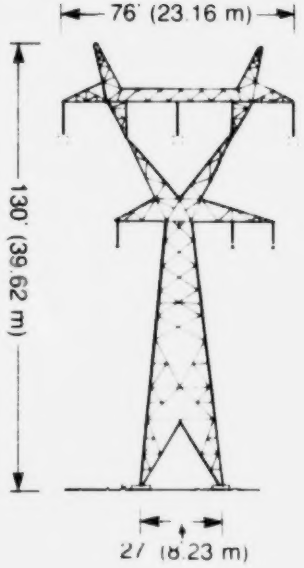

76' (23.16 m)
130' (39.62 m)
27' (8.23 m)

Figure 7.6
500 kV Single Circuit
230 kV Single Circuit Dual Voltage
Lattice Tower

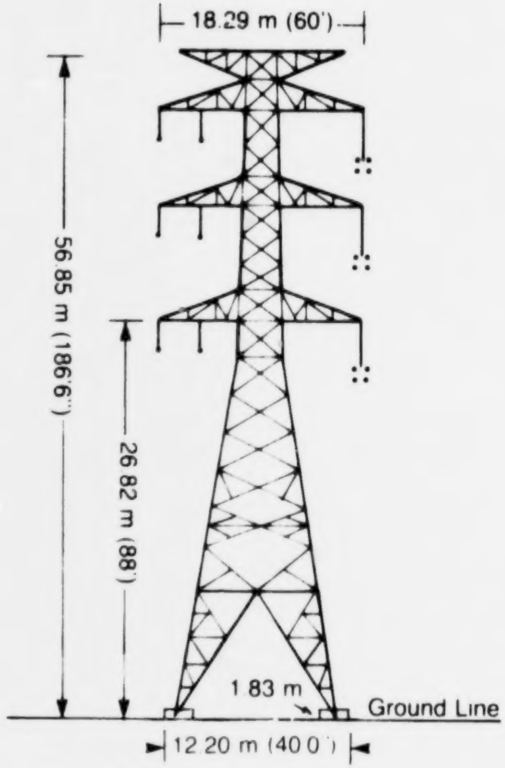

18.29 m (60')
56.85 m (186'6")
26.82 m (88')
1.83 m
Ground Line
12.20 m (40.0')

Figure 7.7
500 kV Single Circuit
230 kV Double Circuit Dual Voltage
Lattice Tower

Line
Numbers

Main Report
Reference

(e) Dual Voltage Structures

Sections of the new lines will parallel existing 115 kV or 230 kV rights of way and the use of a dual voltage or combination tower has been considered. It is possible to consolidate the existing and proposed lines on the structures shown on Figures 7.5 to 7.7.

7.3 Rights of Way

The width of the right of way (ROW) is a function of several design considerations, such as tower height, distance between towers, conductor size, clearances, line security and the condition of the terrain through which the line will pass. The right of way requirement for a single circuit 500 kV line will be between 60-75 m and for two single circuit 500 kV lines will be between 100-130 m. The exact ROW requirements will depend on the tower selected and specific site conditions.

National standards dictate the minimum clearances required from conductors for the protection of adjacent property, and for safe and continuous operation. Table 7.1 shows minimum vertical clearances to 500 kV transmission lines as specified in CSA Standard C22.3, No. 1-M1979, "Overhead Systems and Underground Systems".

Table 7.1

Clearances to 500 kV Transmission Lines

Vertical Clearances	Distance
Land Normally Traversed by Pedestrians Only	6.3 m (21 ft)
Over Roads and Lanes	11.1 m (36 ft)
Over Farm Lands and Lands Accessible to Vehicular Traffic*	9.6 m (31.5 ft)

* Over farm lands, Ontario Hydro goes beyond the CSA Standards and provides a minimum clearance of 12.2 m (40 ft).

7.4 Transformer and Switching Stations

Volume I
Section 7.2

As outlined in the eastern Ontario Plan Stage EA, work is proposed at Hawthorne TS, Merivale TS, St. Lawrence TS and Lennox GS. The work at Merivale TS, St. Lawrence TS and Lennox GS can be accommodated within the existing property limits. At Hawthorne TS, additional property will be required.

Main Report
Reference

7.5 Microwave Radio Stations

Volume I
Section 7.3

A typical microwave radio station requires a parcel of land approximately 30 metres square, close to an all-weather road with an electrical distribution line. Dish antennae mounted on a steel tower, 50 to 100 meters in height are used to transmit and receive radio signals. A typical microwave radio station is shown in Figure 7.8.

8.0 ROUTE STAGE STUDY - WEST SECTION

Volume II
Sections 2.1
and 9.1

The West Section Route Stage study was undertaken by Ontario Hydro to select a recommended route for two single circuit 500 kV transmission lines and sites for associated microwave radio station sites between Lennox GS and Hawthorne TS. The study process included the following steps to select a recommended transmission route and microwave radio station sites:

- introduction of the study, development of telecommunications study areas, and collection of data;

- location of alternative corridors;

- location of alternative routes and sites; and

- selection of recommended route and sites

The study process integrated consideration of those aspects of the natural and social environment which could be affected by transmission facilities, with the technical and cost considerations. At each step in the process, more detailed information was used to eliminate part of the study area from further consideration. Reviews and comments were solicited from all levels of government, interest groups and the public as the study progressed to the selection of the recommended route and sites.

8.1 Public Involvement

Volume II
Sections 2.2
and 9.2

The Route Stage public involvement programme commenced in October, 1982. Its main objectives were to provide opportunities for the public to participate in the planning process. The programme included an Advisory Group, municipal participation centres (MPCs), advertising, media releases, distribution of project status reports and presentations.

Project information was presented to the general public at key stages of the study for their review and comment. The key stages included:

- introduction - October, 1982;
- identification of corridors/study areas - March/April/May, 1983;

Figure 7.8
Typical Microwave Radio Station

Line Numbers

Main Report Reference

- identification of alternative routes/sites - November, 1983; and
- rationale for selection of recommended route and sites - May/June, 1984.

The Advisory Group was composed of individuals representing a broad range of interests. Members included elected and appointed municipal officials, and representatives from provincial ministries, conservation authorities, and county federations of agriculture. Local groups representing agricultural, community/cultural, environmental, recreational, resource, and electrical/energy interests were also represented. Advisory Group meetings were open to the media and the general public.

8.2 The Environment Affected

Volume II
Chapter 3.0

The Route Stage study area, which was approved as part of the Plan Stage decision, encompasses approximately 4,300 square kilometers (1,660 square miles). Included in this area are all or part of 30 townships within four counties and the Regional Municipality of Ottawa-Carleton. The study area is illustrated in Figure 1.1 and includes two major existing Ontario Hydro owned rights of way, namely:

- Lennox GS to Cataraqui TS

This 209 m wide Ontario Hydro owned right of way was acquired in 1973. The proposed 500 kV lines would occupy the area between the two existing 230 kV lines that are located near the edges of this right of way. This right of way will not be expanded.

- Merivale TS to Hawthorne TS

This right of way is, for most of its length, owned by Ontario Hydro or on easement granted by the federal government. At present, 230 kV and 115 kV transmission lines use this right of way. The proposed 500/230 kV lines would replace and consolidate with the existing lines. This right of way will not be expanded except for a small section at the Rideau River crossing.

8.3 Land Use and Environmental Considerations

Volume II
Sections 4.4, 5.2, 10.3 and 11.1

Land use and environmental data were collected and mapped at a 1:50,000 scale (for the corridor/study area phase) and a 1:15,000 scale (for the route/sites phase), according to the following factor categories:

- Agricultural Resources
- Appearance of the Landscape
- Biological Resources
- Engineering/Cost Constraints
- Forest Resources
- Heritage Resources

Main Report Reference

- Human Settlement
- Mineral Resources
- Recreation Resources

This environmental information was used to identify alternative transmission corridors and alternative routes/sites and to evaluate, compare and select the recommended route and sites.

8.4 Socio-Economic Considerations and Public Guidelines

Volume II
Section 6.1,
Appendix B6,
and
Appendix C

Socio-economic considerations included:

- the capability of the people in the study area to handle change
- the compatibility of transmission lines with the nature of the community
- the economic base change associated with transmission lines
- the qualitative changes, real or perceived, which could occur when transmission lines are built.

The most often stated public guidelines were:

- follow existing Ontario Hydro rights of way where possible;
- consider consolidation with or upgrading of existing lines where possible;
- minimize the effects on homes, buildings, and developed areas;
- minimize the effects on agricultural and natural areas.

These guidelines were used in the evaluation and comparison of the alternative routes.

8.5 Technical and Economic Considerations

Volume II
Sections 5.2
and 6.2

8.5.1 Technical Considerations

Various tower types were investigated as outlined in Section 7. Also considered was the extent to which 500 kV transmission lines and microwave radio facilities affect the operation of facilities such as communications systems, licensed airports, and existing linear facilities.

8.5.2 Economic Considerations

The main factors affecting the cost of a transmission line are usually the length of the line, the type of tower used and the number of line angles or turns. Other factors considered in the identification and evaluation of alternative routes are the cost of property rights, right of way cutting, soil conditions, access, and mitigation measures.

The approximate cost of constructing one kilometre of single circuit 500 kV line is $504,000. This assumes stable soil conditions and a typical mix of suspension and angle towers.

For system comparisons, the economic analysis of alternatives was based on a comparison of the present worth of the annual cash flows and accounts for the time related aspects of capital expenditures.

9.0 TRANSMISSION CORRIDOR AND TELECOMMUNICATIONS STUDY AREA IDENTIFICATION

Volume II
Chapters 4.0
and 10.0

The identification of corridors and telecommunications study areas was designed to reduce the size of the initial study area by eliminating higher constraint areas and retaining the potentially more acceptable areas for the facilities for further examination.

A corridor is a continuous linear area generally located through areas of relatively low constraint, where it is more probable that transmission routes could be located with the least effect to the overall environment. Similarly, telecommunications study areas are areas where it is more probable that microwave radio station sites could be located with least effect to the overall environment.

Ontario Hydro developed a series of environmental objectives which were given a resource value rating by the Advisory Group and a possible effects rating by Ontario Hydro. An overall rating for each objective was determined and endorsed by the Advisory Group.

From this base information, a series of constraint maps were prepared and used to locate the alternative transmission corridors.

Two plans with associated study areas were developed to extend the existing microwave telecommunications system from Hinchinbrooke SS to Hawthorne TS. Study areas were determined by first selecting technically acceptable zones and then applying environmental and technical criteria to reduce the zones to study areas with well defined boundaries. The two plans were compared and the best overall plan carried forward to the site identification step.

Volume II
Appendix D

Alternative transmission line corridors are shown in Figure 9.1. Telecommunications study areas for the preferred plan are identified in Figure 9.2.

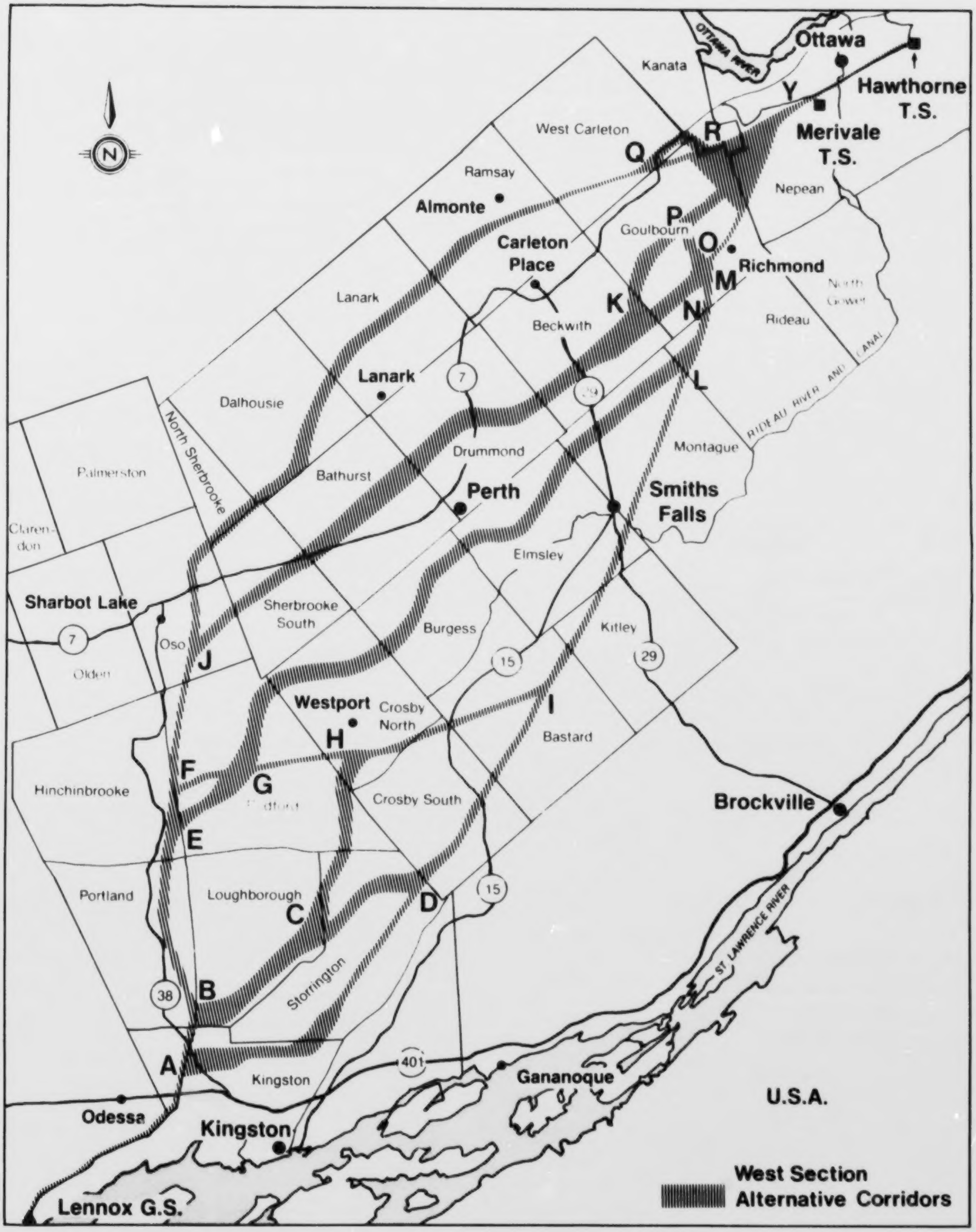

N
Ottawa
OTTAWA RIVER
Kanata
Hawthorne T.S.
Y
Merivale T.S.
West Carleton
Q
R
Ramsay
Nepean
Almonte
P
Goulbourn
O
Richmond
Carleton Place
M
North Gower
Lanark
K
N
Beckwith
Rideau
RIDEAU RIVER AND CANAL
L
Lanark
7
29
Dalhousie
North Sherbrooke
Drummond
Montague
Palmerston
Bathurst
Perth
Smiths Falls
Claren-don
Elmsley
Sharbot Lake
Sherbrooke South
Burgess
Kitley
7
Oso
15
29
Olden
J
Westport
Crosby North
I
H
Bastard
F
G
Hinchinbrooke
Bedford
Crosby South
Brockville
E
Portland
Loughborough
C
D
15
ST. LAWRENCE RIVER
Storrington
38
B
A
401
Kingston
Gananoque
U.S.A.
Odessa
Kingston
Lennox G.S.
West Section
Alternative Corridors

Figure 9.1
Alternative Corridors

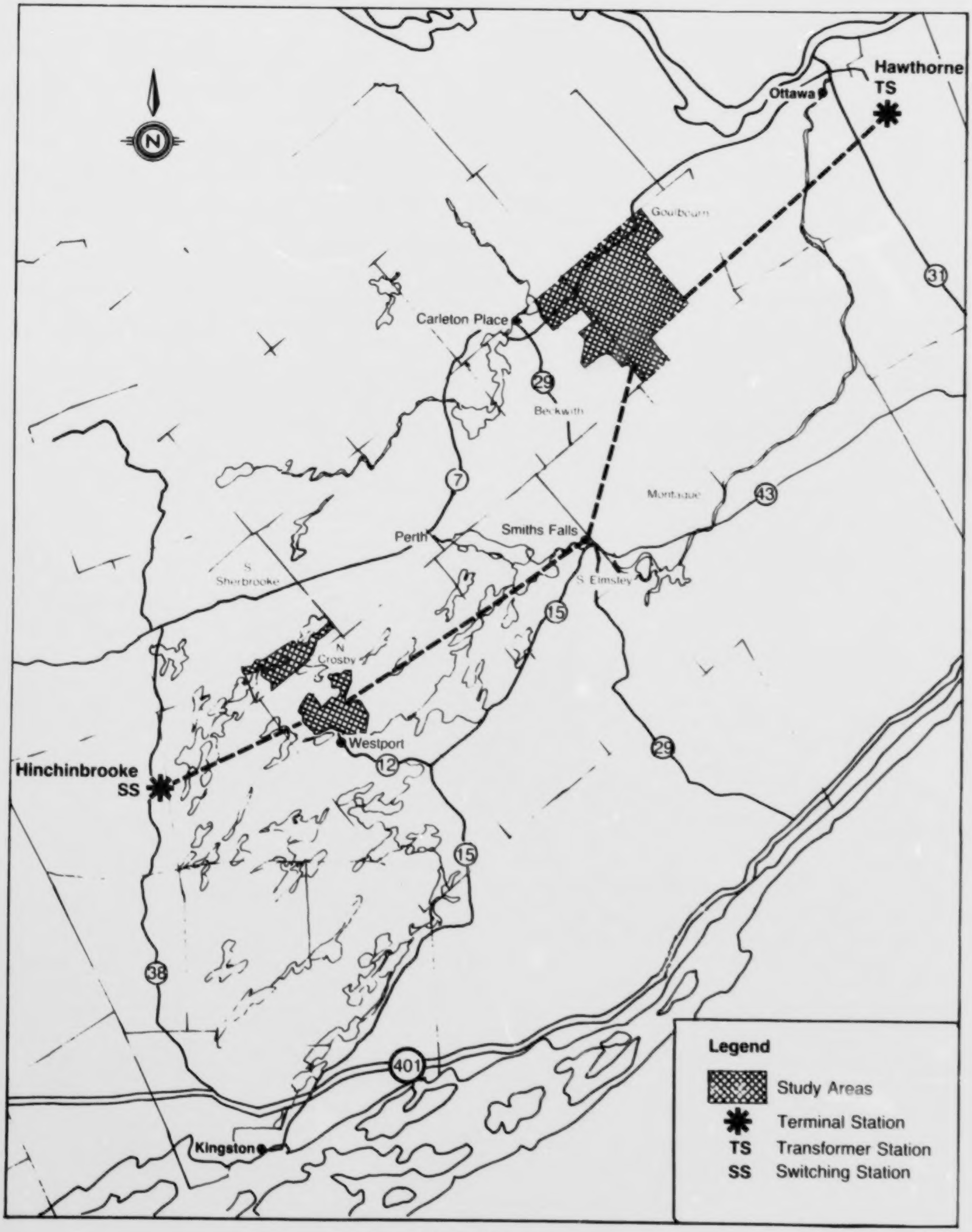

N
Hawthorne
TS
Ottawa
Goulbourn
31
Carleton Place
29
Beckwith
7
Montague
43
Smiths Falls
Perth
S
Sherbrooke
S Elmsley
15
N
Crosby
Westport
12
Hinchinbrooke
SS
29
15
38
401
Kingston
Legend
Study Areas
Terminal Station
TS Transformer Station
SS Switching Station

Figure 9.2
Final Telecommunications Study Areas

Line Numbers

Main Report Reference

10.0 RECOMMENDED ROUTE AND SITES

Volume II Chapters 5.0 and 11.0

10.1 Identification of Alternative Routes and Sites

The next step in the planning process involved the identification of alternative transmission routes and telecommunications sites. These alternatives represented the most suitable locations within the corridors and telecommunications study areas for the required facilities. The alternative routes represent rights of way varying from approximately 100 to 130 metres wide, and the alternative telecommunications sites vary from .2 ha to .4 ha in area.

The types of information collected and mapped were similar to those used to identify corridors but, because of the larger scale, the information was more refined and detailed. Some sections of corridors and study areas that were considered less desirable in terms of their environmental, technical, economic and social implications were dropped from further study. Preliminary route and site alternatives were identified by Ontario Hydro and reviewed by the Advisory Group and the public. Modifications were subsequently suggested by the public and numerous changes were made. The resulting alternative routes and sites are illustrated on the 1:250,000 scale map found in Appendix B.

10.2 Evaluation and Comparison of Alternative Routes and Sites

Volume II Chapters 6.0 and 12.0

The route and site identification process resulted in a number of possible routes and sites being identified. These were evaluated on the basis of land use and environmental, social, economic and technical considerations.

For the land use and environmental analysis, quantitative data were augmented with qualitative comments. Each route and site was then analyzed to determine its potential effects.

Economic and technical considerations included costs, construction implications, and effects on other utilities, transportation and communication facilities.

Each route was also evaluated according to the previously listed socio-economic considerations and public guidelines.

Seven alternative routes were developed and colour coded as shown in Figure 3.1. Comparison of the four most southerly routes resulted in the elimination from further consideration of the Purple, Brown, and Orange Routes. The Brown/Orange Route was then developed and would involve the construction of the first line along the Brown Route and the second line along the Orange Route.

Main Report Reference

Comparison of the three most northerly routes resulted in the elimination from further consideration of the Red and Blue Routes.

The three alternatives retained for final comparison were the Yellow, Green and Brown/Orange Routes (refer to Figure 10.1).

For the telecommunications study, eight alternative sites were identified in North Crosby/South Sherbrooke study area and six in the Goulbourn/Beckwith study area. The sites within each area were compared and the best sites selected for recommendation.

10.3 Selection of the Recommended Routes and Sites

Volume II Chapters 7.0 and 13.0

10.3.1 Selection Rationale - Transmission

The results of the evaluation and comparison indicated that the Yellow Route would have relatively low potential effects on most land use and environmental and socio-economic factors and be the least expensive to construct. The major reasons for selection are as follows:

- generally lower effect on most environmental factors;
- follows existing rights of way as much as possible, while minimizing effect on human settlement;
- lower socio-economic effect;
- utilizes right of way between Smiths Falls and Richmond on which existing 115 kV line can be removed;
- adheres, for the most part, to public guidelines;
- least costly alternative;
- lower potential for additional property and narrow base tower costs;
- shortest route length.

Construction on any route would create some temporary positive effects such as increased employment and business activity in eastern Ontario.

10.3.2 Recommended Route

Volume II Section 7.1

The recommended route is illustrated in Appendix B and is described as follows:

- Lennox GS to Point A
  - occupy the existing Ontario Hydro right of way for the entire distance (28.4 km)

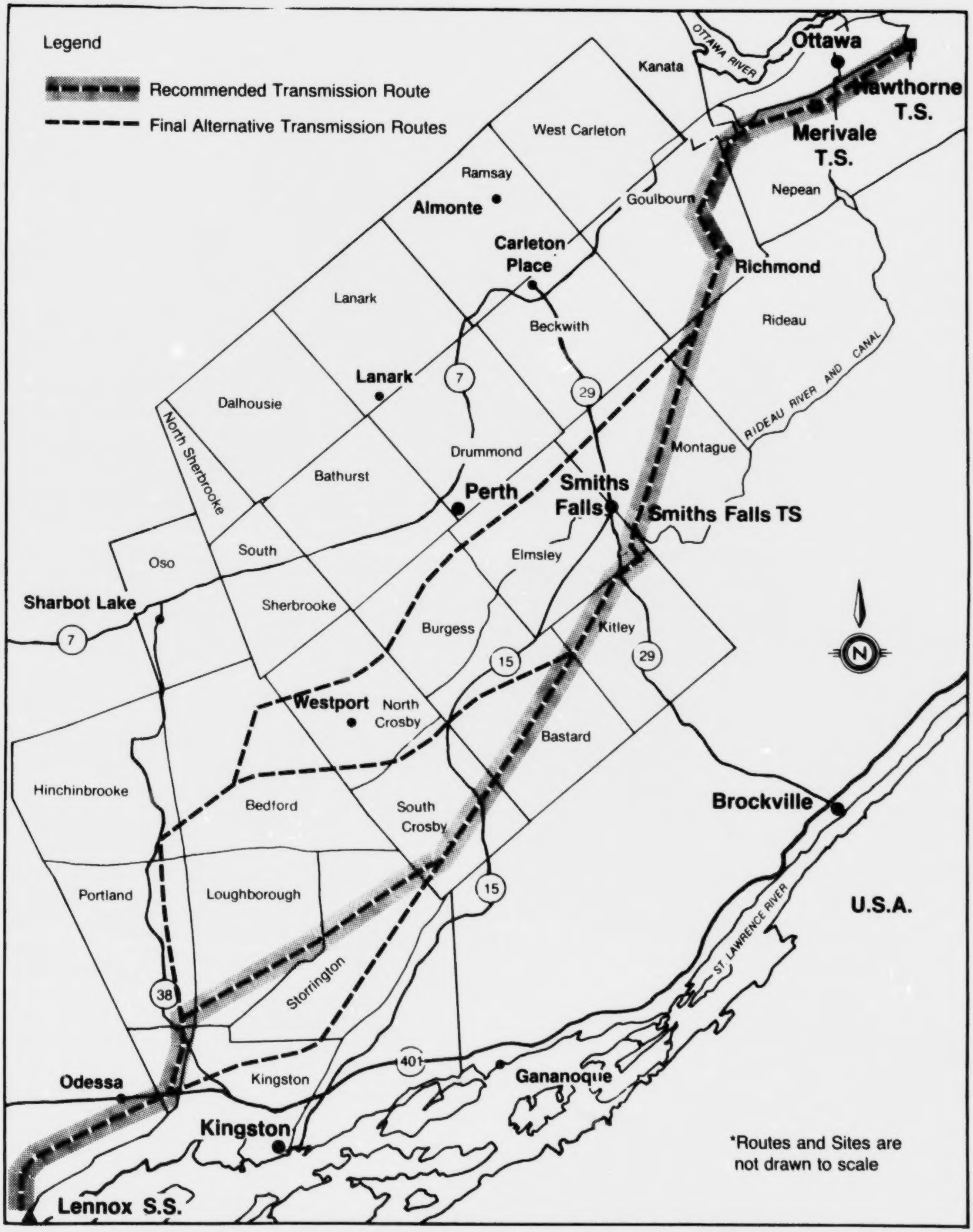

Legend
Recommended Transmission Route
Final Alternative Transmission Routes
Ottawa
OTTAWA RIVER
Kanata
Hawthorne T.S.
Merivale T.S.
West Carleton
Ramsay
Almonte
Goulbourn
Nepean
Carleton Place
Richmond
Lanark
Beckwith
Rideau
RIDEAU RIVER AND CANAL
7
29
Dalhousie
Lanark
North Sherbrooke
Drummond
Montague
Bathurst
Perth
Smiths Falls
Smiths Falls TS
South
Elmsley
Oso
Sharbot Lake
Sherbrooke
Burgess
Kitley
7
15
29
Westport
North Crosby
Bastard
Hinchinbrooke
Bedford
South Crosby
Brockville
Portland
Loughborough
15
U.S.A.
ST. LAWRENCE RIVER
Storrington
38
401
Kingston
Odessa
Gananoque
Kingston
*Routes and Sites are not drawn to scale
Lennox S.S.

Figure 10.1
Recommended Route and Final Alternatives

Main Report Reference

- Point A to B
  - use existing right of way for 3.9 km
- Points B to C to D
  - acquire new property rights for two 500 kV lines for 35 km
- Points D to I to Smiths Falls TS
  - points D to I to Smiths Falls By-Pass - parallel the existing 115 kV line with the first 500 kV line. Remove the existing 115 kV line and consolidate with the second 500 kV line. Acquire new property rights including existing 31 m easement for a distance of 41 km;
  - Smiths Falls By-Pass IL1 - acquire new property rights for the two 500 kV lines for 3.5 km;
  - Smiths Falls By-Pass to Smiths Falls TS - parallel the existing 115 kV line with the first 500 kV line. Remove the existing 115 kV line and consolidate with the second 500 kV line. Acquire new property rights including existing 31 m easement for 1.5 km.
- Smiths Falls TS to Point O_1
  - remove the existing 115 kV line between Smiths Falls TS and Richmond Distributing Station (DS) and acquire rights for the two 500 kV lines including the existing 31 m easement for a total distance of 34.5 km.
- Point O_1 to R
  - acquire new property rights for 500 kV lines for 15.6 km.
- Point R to Y to Merivale TS to Hawthorne TS
  - remove existing lines and consolidate with the new 500 kV lines. Acquire property rights for new facilities between R and Y. The proposed lines can occupy Ontario Hydro owned land for most of the route between point Y and Hawthorne TS.

The total length of the recommended route from Lennox GS to Hawthorne TS is about 185 km.

Typical tower designs are shown schematically in Figure 7.1, 7.2, 7.3, 7.6 and 7.7. With the following exceptions, all suspension structures and angle structures would be conventional four footing lattice towers

Main Report Reference

(Figure 7.1). It is proposed that the narrow base lattice towers (Figure 7.2) would be used for suspension structures located in open cultivated fields of prime farm land and specialty crops, in accordance with criteria established by Ontario Hydro and the Ontario Federation of Agriculture. In areas of rugged terrain, V-guyed towers (Figure 7.3) would be used for suspension structures. In areas of consolidation with existing lines, special multi-voltage towers would be designed (Figure 7.6 and 7.7) to accommodate the specific conditions.

10.3.3 Selection Rationale - Telecommunications Sites

Volume II
Section 13.1

As a result of the evaluation and comparison process, sites W2 and M3 were selected as the recommended sites for the following reasons:

W2 - North Crosby/South Sherbrooke Study Area

- vacant land with very low productive capability
- few residents in immediate vicinity
- low visibility
- best access and site conditions
- lowest cost
- willing seller (30 month option obtained)

M3 - Goulbourn/Beckwith Study Area

- abandoned pit with no additional granular material present
- few residents in immediate vicinity
- low visibility
- best access and site conditions
- lowest cost
- willing seller (30 month option obtained)

No alternatives to a site at Smiths Falls were considered for the following reasons:

- located on existing Ontario Hydro property
- near industrial area
- few residents in immediate vicinity
- excellent site conditions
- potential for eliminating leased telecommunications facilities

No alternatives were considered to the site at Hawthorne TS because the facilities are technically required at this location. This site has the advantage of being in an industrial area with few residents in the immediate vicinity.

The locations of the recommended sites are shown in Appendix B.

Main Report Reference

11.0 MITIGATION OF EFFECTS

Volume II Sections 7.1 and 13.2

Environmental changes or effects would result from the construction of two 500 kV transmission lines and associated telecommunications facilities. Ontario Hydro would endeavor to minimize the extent and duration of these effects through the application of appropriate mitigation, and restoration measures. These measures would be applied in accordance with Ontario Hydro's "Construction and Site Restoration Guidelines for Transmission Facilities, March 1981", approved by the Minister of the Environment. These include a broad range of mitigation, restoration and/or compensation measures which would be applied as necessary and appropriate. Specific mitigation procedures would be developed in the course of final route design and tower placement.

12.0 RELATED ONTARIO HYDRO STUDIES AND REPORTS

(i) Eastern Ontario Transmission Plan Stage Environmental Assessment, July 1980.

(ii) Construction and Site Restoration Guidelines for Transmission Facilities, March 1981.

13.0 POST-APPROVAL ACTIVITIES

Volume II Chapters 8.0 and 14.0

Following approval by the Joint Board, Ontario Hydro would proceed to refine the location and design of the transmission line and telecommunications sites and determine the specific methods of construction and mitigation. Consultation with directly affected parties would be carried out prior to preparation of final design plans and then property acquisition would be undertaken. After possession of the necessary property rights is obtained, construction would begin together with environmental monitoring.

APPENDIX A

List of the Locations of the Document Repositories

A1 Location of Map and Document Repositories

A2 Location of Repositories for Exhibits and Other Hearings Record Documents

A3 Locations of Document Repositories at Ontario Hydro Offices

APPENDIX A1

Locations of Map and Document Repositories

MUNICIPAL OFFICES

- West Section -

REGIONAL MUNICIPALITY	MAILING ADDRESS
Ottawa-Carleton	222 Queen Street Ottawa, Ontario K1P 5Z3
TOWNSHIPS	
Goulbourn	PO Box 189 Stittsville, Ontario K0A 3G0
Rideau	PO Box 310 North Gower, Ontario K0A 2T0
West Carleton	PO Box 410 Carp, Ontario K0A 1L0
CITIES	
Kanata	Ste. 200 150 Katimavik Road Kanata, Ontario K2L 2N3
Nepean	3825 Richmond Road Nepean, Ontario K2H 5C2
Ottawa	111 Sussex Drive Ottawa, Ontario K1N 5A1
COUNTY	
Frontenac	Court House Court Street Kingston, Ontario K7L 2N4

TOWNSHIPS	MAILING ADDRESS
Bedford	RR #2 Godfrey, Ontario K0H 1T0
Hinchinbrooke	RR #1 Highway 38 Parham, Ontario K0H 2K0
Kingston	Postal Bag 3400 Kingston, Ontario K7L 4Z4
Loughborough	PO Box 100 Sydenham, Ontario K0H 2T0
Oso	PO Box 89 Sharbot Lake, Ontario K0H 2P0
Palmerston & North & South Canonto	Snow Road Station Ontario K0H 2R0
Portland	Hartington, Ontario K0H 1W0
Storrington	RR #1 Battersea, Ontario K0H 1H0
COUNTY	
Lanark	County Admin. Building Sunset Boulevard PO Box 37 Perth, Ontario K7H 3E2
SEPARATED TOWN	
Smiths Falls	PO Box 695 Town Hall 77 Beckwith Street North Smiths Falls, Ontario K7A 4T6

TOWNS	MAILING ADDRESS
Almonte	PO Box 400 14 Bridge Street Almonte, Ontario K0A 1A0
Carleton Place	175 Bridge Street Carleton Place, Ontario K7C 2V8
Perth	Town Hall 80 Gore Street East Perth, Ontario K7H 1H9
TOWNSHIPS	
Bathurst	RR #4 Perth, Ontario K7H 3C6
Beckwith	RR #2 Carleton Place, Ontario K7C 3P2
Drummond	RR #6 Perth, Ontario K7H 3C8
Lanark	RR #2 Lanark, Ontario K0G 1K0
Lavant, Dalhousie & North Sherbrooke	PO Box 21 McDonald's Corners, Ontario K0G 1M0
Montague	PO Box 755 Smiths Falls, Ontario K7A 4W6
North Burgess	RR #3 Perth, Ontario K7H 3C5
North Elmsley	RR #5 Perth, Ontario K7H 3C7

TOWNSHIPS	MAILING ADDRESS
Ramsay	RR #2 Almonte, Ontario K0A 1A0
South Sherbrooke	RR #1 Maberly, Ontario K0H 2B0
UNITED COUNTIES	
Leeds & Grenville	PO Box 729 Court House Brockville, Ontario K6V 5V8
VILLAGES	
Newboro	Newboro, Ontario K0G 1P0
Westport	PO Box 68 Bedford Street Westport, Ontario K0G 1X0
TOWNSHIPS	
Bastard & South Burgess	PO Box 500 Delta, Ontario K0E 1G0
Kitley	Toledo, Ontario K0E 1Y0
North Crosby	PO Box 8 Church Street Westport, Ontario K0G 1X0
South Crosby	RR #1 Elgin, Ontario K0G 1E0
South Elmsley	Lombardy, Ontario K0G 1L0

TOWNSHIPS	MAILING ADDRESS
Wolford	PO Box 1 RR #3 Jasper, Ontario K0G 1G0
COUNTY	
Lennox & Addington	Postal Bag 1000 97 Thomas Street East Napanee, Ontario K7R 3S9
TOWNSHIPS	
Ernestown	PO Box 57 Odessa, Ontario K0H 2H0
South Fredericksburgh	RR #2 Napanee, Ontario K7R 3K7

MUNICIPAL OFFICES

- East Section -

UNITED COUNTIES	MAILING ADDRESS
Stormont, Dundas & Glengarry	20 Pitt Street Cornwall, Ontario K6J 3P2
CITY	
Cornwall	PO Box 877 360 Pitt Street Cornwall, Ontario K6H 5T9
TOWNSHIPS	
Cornwall	RR #1 Long Sault, Ontario K0C 1P0
Finch	PO Box 99 Victoria & Beaver Streets Berwick, Ontario K0C 1G0
Osnabruck	PO Box 340 Ingleside, Ontario K0C 1M0
Roxborough	PO Box 189 Moose Creek, Ontario K0C 1W0
Winchester	PO Box 40 Morewood, Ontario K0A 2R0
REGIONAL MUNICIPALITY	
Ottawa-Carleton	222 Queen Street Ottawa, Ontario K1P 5Z3

CITY	MAILING ADDRESS
Gloucester	PO Box 8333 4550 Bank Street Gloucester, Ontario K1G 3V5
Ottawa	111 Sussex Drive Ottawa, Ontario K1N 5A1
TOWNSHIPS	
Cumberland	PO Box 15 RR #3 Navan, Ontario K0A 2S0
Osgoode	PO Box 130 Victoria Street Metcalfe, Ontario K0A 2P0
UNITED COUNTIES	
Prescott & Russell	PO Box 304 Court Street L'Original, Ontario K0B 1K0
VILLAGE	
Casselman	PO Box 180 23 St. Isidore Road Casselman, Ontario K0A 1M0
TOWNSHIPS	
Cambridge	PO Box 86 St. Albert, Ontario k0A 3C0
Russell	PO Box 570 668 Norte Dame Street Embrun, Ontario K0A 1W0
South Plantagenet	PO Box 10 Fournier, Ontario K0B 1G0

PUBLIC LIBRARIES

- West Section -

Almonte Public Library Board
PO Box 820
115 High Street
Almonte, Ontario
K0A 1A0

Bath Branch
Lennox & Addington County Public
Library Board
RR #1
Bath, Ontario
K0H 1G0

Carleton Place Public Library Board
101 Beckwith Street
Carleton Place, Ontario
K7C 2T3

Eastman Resource Centre Branch
Rideau Township Public Library Board
Rideau Valley Middle School
PO Box 99
Kars, Ontario
K0A 2E0

Goulbourn Township Public Library
Board
PO Box 760
Stittsville, Ontario
K0A 3G0

Inverary Branch
Frontenac County Public Library
Board
Inverary, Ontario
K0H 1X0

Kingston Public Library Board
130 Johnson Street
Kingston, Ontario
K7L 1X8

Arnprior Public Library Board
35 Madawaska Street
Arnprior, Ontario
K7S 1R6

Brockville Public Library Board
PO Box 100
21 George Street
Brockville, Ontario
K6V 5T7

Delta Branch
South Crosby et al Union Public
Library Board
Delta, Ontario
K0E 1N0

Frontenac County Public Library
Board
130 Days Road
Kingston, Ontario
K7M 3P8

Hartington Branch
Frontenac County Public Library
Board
Hartington, Ontario
K0H 1W0

Kanata Public Library Board
50 Castlefrank Road
Kanata, Ontario
K2L 2N5

Lanark Public Library Board
PO Box 249
George Street
Lanark, Ontario
K0G 1K0

Line
Numbers

Lennox & Addington County Public
Library Board
37 Dundas Street West
Napanee, Ontario
K7R 1Z5

Newboro Branch
South Crosby et al Union Public
Library Board
Newboro, Ontario
K0G 1P0

Ottawa Public Library Board
120 Metcalfe Street
Ottawa, Ontario
K1P 5M2

Portland Branch
South Crosby et al Union Public
Library Board
Portland, Ontario
K0G 1V0

Rideau Township Public Library Board
PO Box 430
Ann Street
Manotick, Ontario
K0A 2N0

Smiths Falls Public Library Board
81 Beckwith Street North
Smiths Falls, Ontario
K7A 2B9

South Elmsley Township Public
Library Board
c/o Lombardy Public School
RR #1
Lombardy, Ontario
K0G 1L0

Nepean Public Library Board
16 Rowley Avenue
Nepean, Ontario
K2G 1L9

Newburgh Branch
Lennox & Addington County Public
Library Board
PO Box 86
Newburgh, Ontario
K0K 2S0

Perth Public Library Board
30 Herriott Street
Perth, Ontario
K7H 1T2

Richmond Branch
Goulbourn Township Public
Library Board
130 Perth Street
Richmond, Ontario
K0A 2Z0

Sharbot Lake Branch
Frontenac County Public Library
Board
PO Box 251
Sharbot Lake, Ontario
K0H 2P0

South Crosby et al Union Public
Library Board
PO Box 89
Halladay Street
Elgin, Ontario
K0G 1E0

Sydenham Branch
Frontenac County Public Library
Board
PO Box 88
Sydenham, Ontario
K0H 2T0

Line
Numbers

West Carleton Township Public Board
PO Box 220
Carp Memorial Hall
Main Street
Carp, Ontario
K0A 1L0

Westport Public Library Board
PO Box 28
Spring Street
Westport, Ontario
K0G 1X0

PUBLIC LIBRARIES

- East Section -

Avonmore Branch
Stormont, Dundas & Glengarry
Avonmore, Ontario
K0C 1C0

Casselman Public Library Board
re Dollard
Casselman, Ontario
K0A 1M0

Cumberland Township Public Library
Board
PO Box 239
Ecole Richard
Regional Road 28
Navan, Ontario
K0A 2S0

Gloucester Public Library Board
2721 Bank Street
Gloucester, Ontario
K1T 1N1

Long Sault Branch
Stormont, Dundas & Glengarry
County Public Library Board
Long Sault, Ontario
K0C 1P0

Newington Branch
Stormont, Dundas & Glengarry
County Public Library Board
Newington, Ontario
K0C 1Y0

Russell Township Public Library Board
PO Box 280
472 Concession Street
Russell, Ontario

Stormont, Dundas & Glengarry
County Public Library Board
PO Box 939
150 Edward Street
Cornwall, Ontario
K6H 5V1

Cambridge Township Public
Library Board
PO Box 99
St. Albert, Ontario
K0A 3C0

Chesterville Branch
Stormont, Dundas & Glengarry
County Public Library Board
Chesterville, Ontario
K0C 1H0

Finch Branch
Stormont, Dundas & Glengarry
County Public Library Board
Finch, Ontario
K0C 1K0

Limoges Branch
Cambridge Township Public Library
Board
PO Box 70
Limoges, Ontario
K0A 2M0

Metcalfe Branch
Osgoode Township Public Library
Board
PO Box 299
Metcalfe, Ontario
K0A 2P0

Ottawa Public Library Board
120 Metcalfe Street
Ottawa, Ontario
K1P 5M2

St. Andrews West Branch
Stormont, Dundas & Glengarry
County Public Library Board
St. Andrew, Ontario
K0C 2A0

APPENDIX A2

Repositories for Transcripts, Exhibits and other Hearings Record Documents

(1) Kingston

Frontenac County Public Library
Kingston Township Branch
130 Days Road
Kingston; Ontario
K7M 3P8

(2) Smiths Falls

Smiths Falls Public Library
81 Beckwith St. North
Smiths Falls, Ontario

(3) Ottawa

Ottawa Public Library
120 Metcalfe Street
Ottawa, Ontario

(4) Cornwall

Stormont, Dundas & Glengarry County Library
150 Edward Street
Cornwall, Ontario
K6H 5V1

APPENDIX A3

Document Repositories

Ontario Hydro Offices

Head Office
700 University Avenue
Toronto, Ontario
M5G 1X6

Ottawa District Office
106 Colonnade Road North
Suite 210
Nepean, Ontario
K2E 7L6

Eastern Regional Office
420 Dundas Street East
Belleville, Ontario
K8N 5C3

West Section

Kingston Area Office
PO Box 910
1037 Sydenham Road
Kingston, Ontario
K7M 3L8

Perth Area Office
99 Drummond Street West
Perth, Ontario
K7H 3E7

Arnprior Area Office
PO Box 70
277 Madawaska Boulevard
Arnprior, Ontario
K7S 3H3

East Section

Winchester Area Office
PO Box 360
St. Lawrence Street
Winchester, Ontario
K0C 2K0

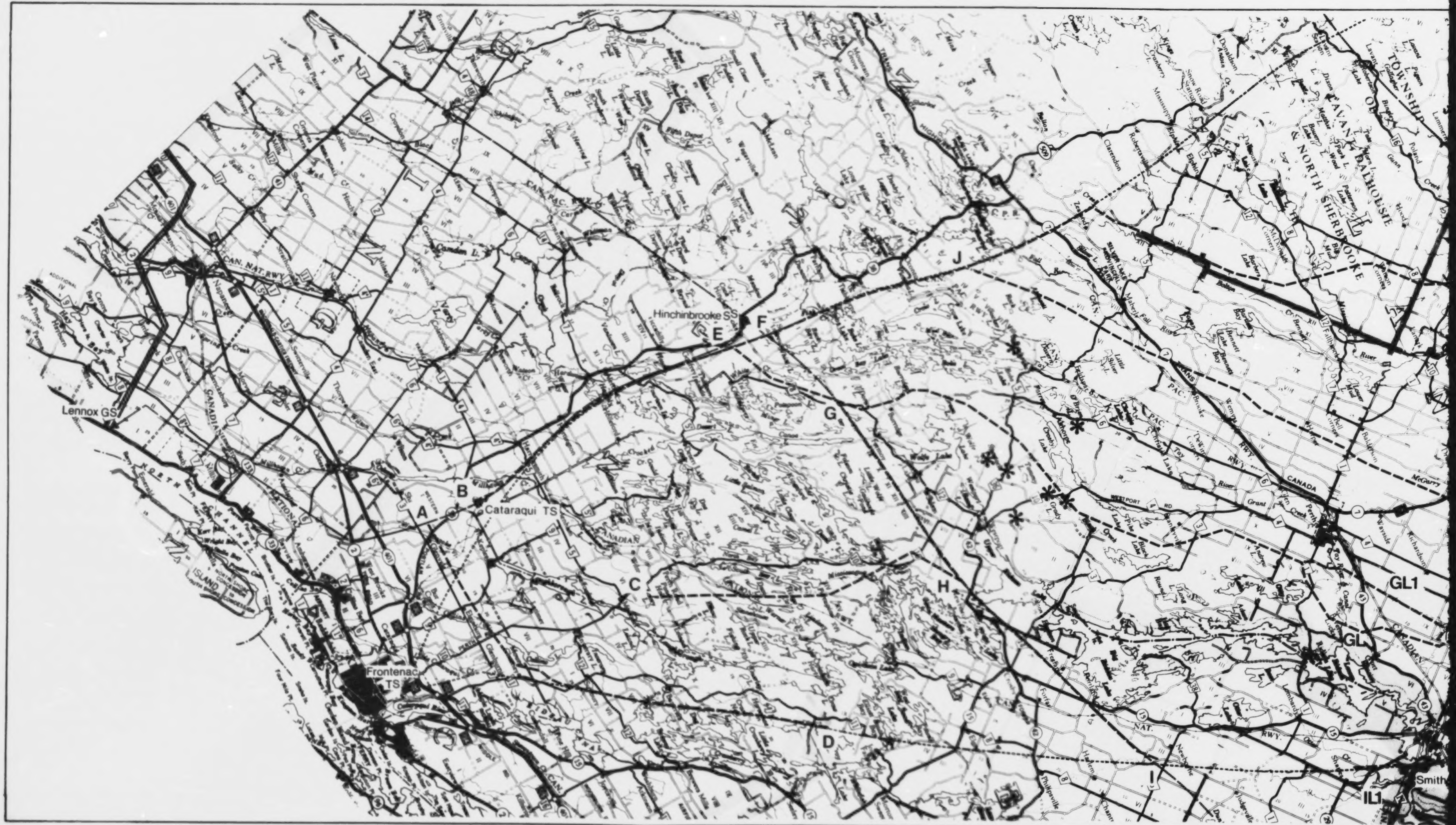
Vankleek Hill Area Office
PO Box 250
Queen Street
Vankleek Hill, Ontario
K0B 1R0

Cornwall District Office
(R.H. Saunders GS)
PO Box 999
Cornwall, Ontario
K6H 5Z1

Line
Numbers

APPENDIX B

1:250,000 Map of Recommended Route and Sites


Hinchinbrooke SS
E
F
J
Lennox GS
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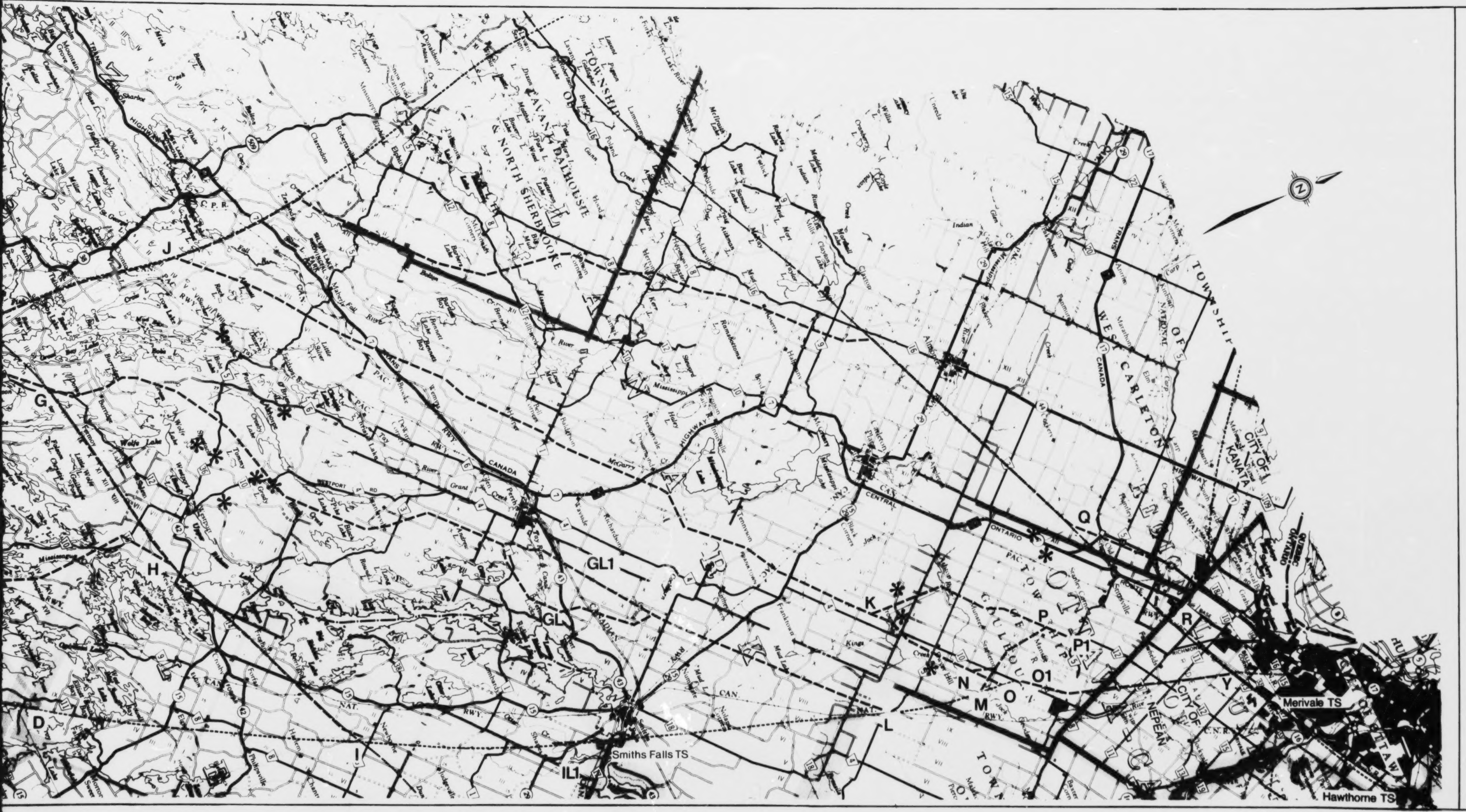
B
A
Cataraqui TS
C
H
GL1
GL
Frontenac TS
D
I
IL1
Smith
TOWNSHIP OF LAVANT, DALHOUSIE & NORTH SHERBROOKE
CAN. NAT. RWY.
CAN. PAC. RWY.
NORTH CHANNEL
CANADIAN NATIONAL
WESTPORT RD
CANADA
RWY.
PAC.
NAT.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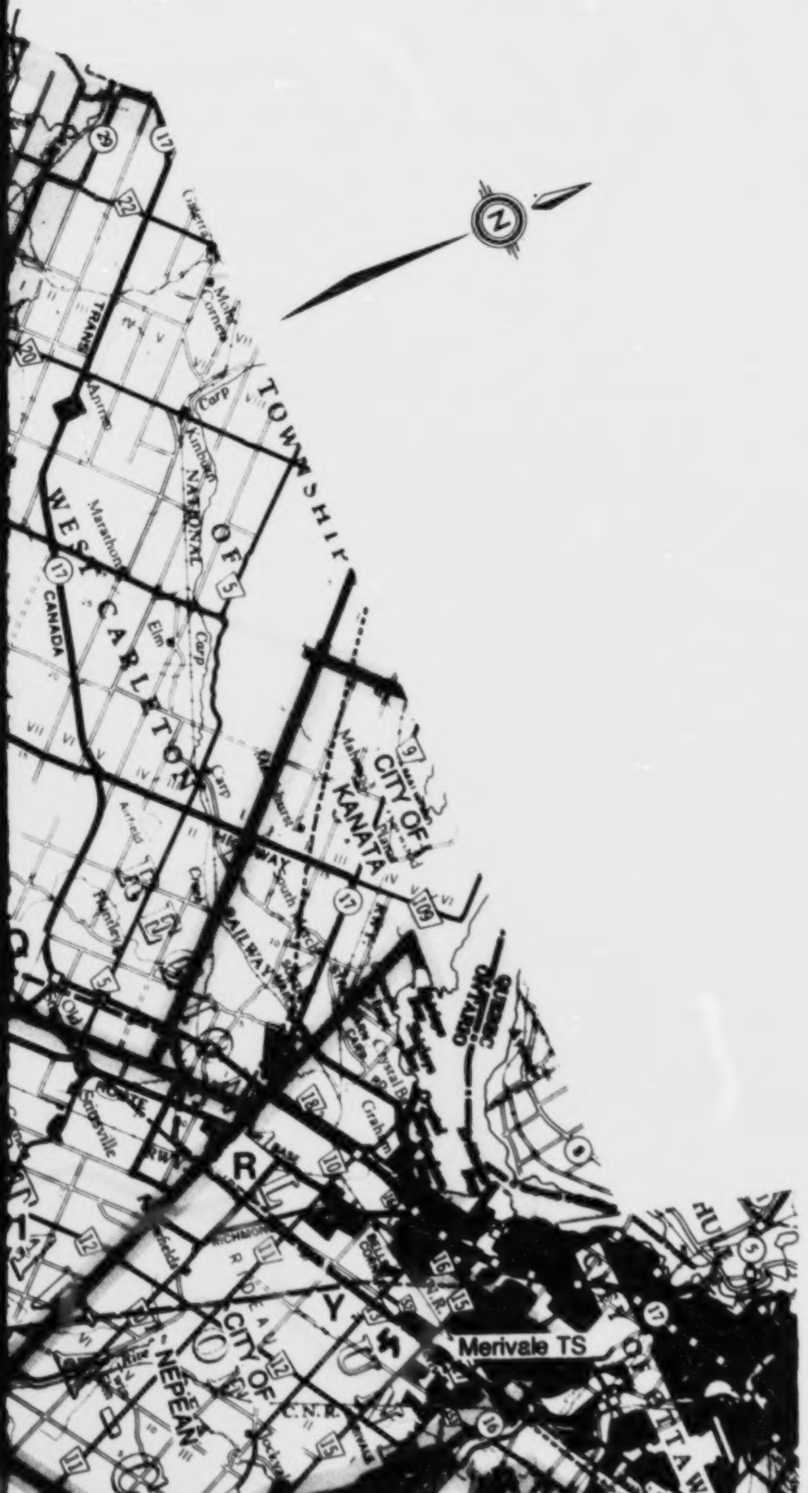
Q
R
Y
Smiths Falls TS
Merivale TS
Hawthorne TS
TOWNSHIP OF LANARK
DALHOUSIE & NORTH SHERBROOKE
WEST CARLETON
TOWNSHIP OF
CITY OF KANATA
CITY OF NEPEAN
CITY OF OTTAWA
TOWNSHIP OF GOULBOURN
C.P.R.
CANADA
HIGHWAY
Wolfe Lake
Mississippi
McGarry
Grant
Richmond
QUEBEC
ONTARIO
N


N
TOWNSHIP OF WEST CARLETON
CITY OF KANATA
CITY OF NEPEAN
CITY OF OTTAWA
TRANS CANADA HIGHWAY
NATIONAL
Carp
Marathon
Kinburn
Antrim
Fitzroy
Carp
Dunrobin
Manotick
Merivale TS
Hawthorne TS
C.N.R.
QUEBEC
ONTARIO
17
5
16
R
Y

Appendix B

Recommended Route and Sites

Legend

━━ Existing 500 kV Line

— — Existing 230 kV Line

------------ Existing 115 kV Line

■ Transformer or Switching Station

A Route Intersection

Recommended Telecommunication Sites

* Alternative Telecommunication Sites

Recommended Route

- - - - Alternative Routes

Alternative routes and sites
are not drawn to scale

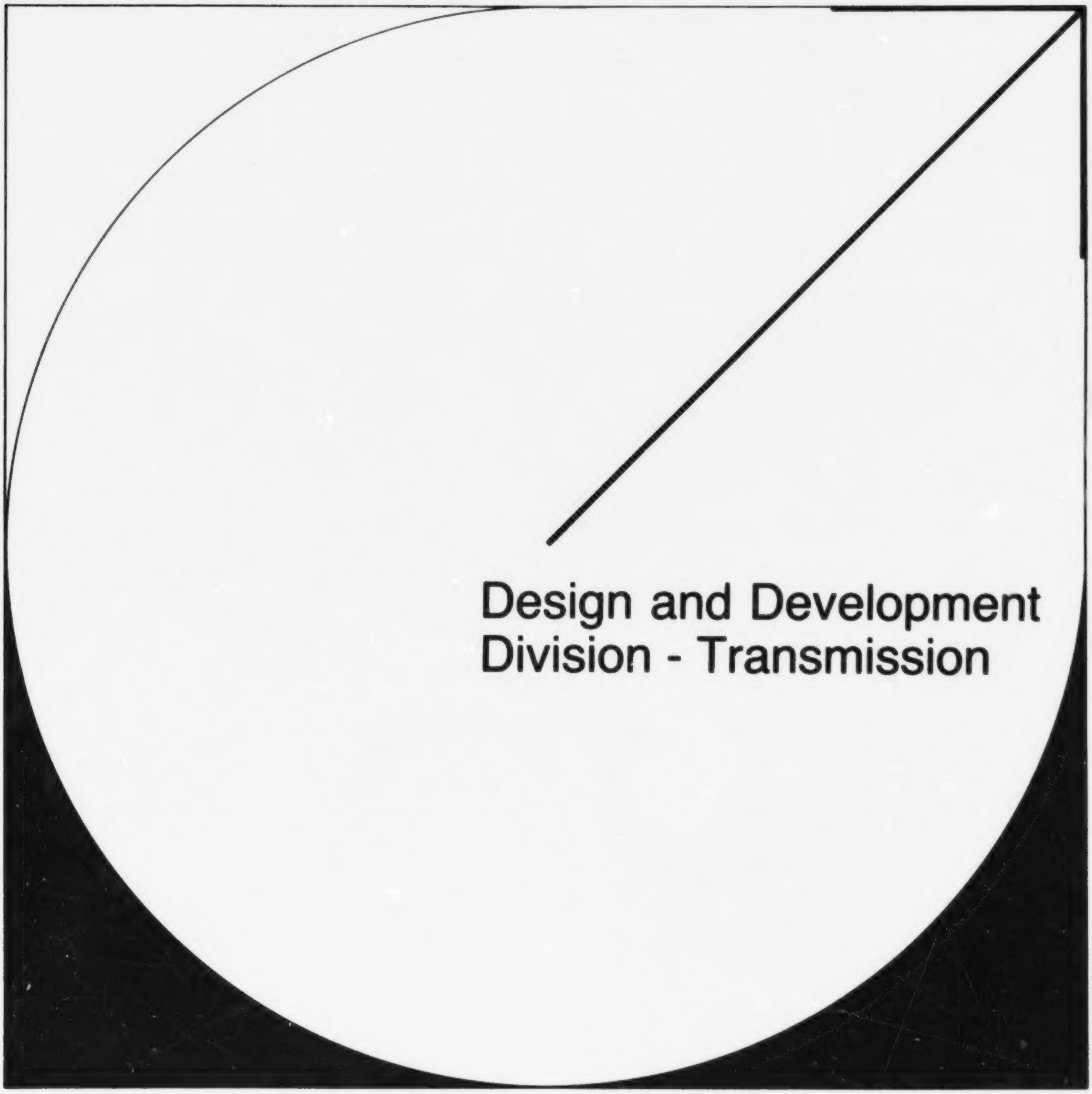
Scale 1 250,000

5 0 5 Miles

5 0 5 Kilometres

Eastern Ontario Study – West Section

Eastern Ontario Transmission Line Study
Route Stage Environmental Assessment
Summary – Volume III



Design and Development
Division - Transmission

Eastern Ontario Transmission Line Study

Route Stage Environmental Assessment

Summary of Volume III

St. Lawrence TS (Cornwall) to Hawthorne TS (Ottawa)

March, 1985

Report No. 85026

A NOTE TO THE READER

This is a summary of Volume III of the Environmental Assessment (EA) which describes the studies and public participation activities carried out to determine the recommended route, and sites for associated telecommunications facilities, for the installation of new bulk transmission facilities in eastern Ontario. Volume III of the Environmental Assessment has been submitted to the Joint Board under the Consolidated Hearings Act, 1981. It has also been forwarded to the Minister of the Environment. Volume I and Volume II describing the general issues and the locations studies for the West Section (Kingston to Ottawa) were submitted August, 1984.

Copies of Volume III of the Environmental Assessment have been sent to public libraries and municipal offices within the study area, together with large scale maps (1:15,000) for the local area. Copies of transcripts, exhibits and other hearing record documents will also be made available at selected libraries. These locations are set out in Appendix A of this Summary.

A copy of the Environmental Assessment is also available for reference at the Ontario Hydro offices in eastern Ontario listed in Appendix A.

Anyone requiring further information should contact:

Mr. T.A. Normet
Senior Project Engineer
Design and Development Division
- Transmission
Ontario Hydro H8 F2
700 University Avenue
Toronto, Ontario
M5G 1X6
Telephone: (416) 592-4935

OR

Mr. C.E.B. Taylor
Senior Community Relations Officer
Design and Development Division
- Transmission
Ontario Hydro H8 E4
700 University Avenue
Toronto, Ontario
M5G 1X6
Telephone: (416) 592-7842

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4.0 RECOMMENDED ROUTE AND SITES 7

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1.0 INTRODUCTION

Volume III
Chapter 1.0

The Environmental Assessment (EA) Report for the Route Stage consists of three volumes.

Volume I - covers those aspects of the study which are common to both the proposed transmission lines and telecommunications facilities between Lennox Generating Station (GS) and Hawthorne Transformer Station (TS), and the transmission line and telecommunications facilities between St. Lawrence TS and Hawthorne TS. It also includes a description of the undertaking, an update of the need for the proposed facilities, an update on alternatives and a description of the proposed facilities.

Volume II - describes the study to select the recommended route for two single circuit 500 kilovolt (kV) lines from Lennox GS to Hawthorne TS and sites for associated telecommunications facilities (West Section).

Volume III - describes the study to select the recommended route for one single circuit 500 kV line from St. Lawrence TS to Hawthorne TS and sites for associated telecommunications facilities (East Section).

This document summarizes Volume III of the EA.

2.0 ROUTE STAGE STUDY - EAST SECTION

Volume III
Sections 2.1
and 9.1

The East Section Route Stage study was undertaken by Ontario Hydro to select a recommended route for a single circuit 500 kV transmission line and sites for associated microwave radio stations between Hawthorne TS and St. Lawrence TS. The study process included the following steps to select a recommended transmission route and microwave radio station sites:

- introduction of the study, development of telecommunications study areas, and collection of data;
- location of alternative corridors;
- location of alternative routes and sites; and
- selection of recommended route and sites

The study process integrated consideration of those aspects of the natural and social environment which could be affected by transmission facilities, with the technical and cost considerations. At each step in the process, more detailed information was used to eliminate part of the study area from further consideration. Reviews and comments were solicited from all levels of government, interest groups and the public as the study progressed to the selection of the recommended route and sites.

2.1 Public Involvement

Volume III
Sections 2.2
and 9.2

The Route Stage public involvement programme commenced in October, 1982. Its main objective was to provide opportunities for the public to participate in the planning process. The programme included a Regional Committee, municipal participation centres (MPCs), advertising, media releases, distribution of project status reports and presentations.

Project information was presented to the public at key stages of the study for their review and comment. The key stages included:

- introduction - October, 1982;
- identification of corridors/study areas - March/April, 1983;
- identification of alternative routes/sites - September, 1984; and
- rationale for selection of recommended route and sites - March, 1985.

The Regional Committee was composed of individuals representing a broad range of interests. Members included elected and appointed municipal officials, and representatives from provincial ministries, conservation authorities, and county federations of agriculture. Local groups representing agricultural, community/cultural, environmental, recreational, resource, and electrical/energy interests were also represented. Regional Committee meetings were open to the media and the public.

2.2 The Environment Affected

Volume III
Chapter 3.0

The study area encompassed approximately 1,530 square kilometres (590 square miles). Included in this area were all or part of eight townships within four counties, the eastern part of the Regional Municipality of Ottawa-Carleton, and the City of Cornwall.

The study area boundaries were drawn to exclude major built up areas and areas of environmental sensitivity while providing a large enough area to allow for the location of a reasonable number of alternative routes.

2.3 Land Use and Environmental Considerations

Volume III
Sections 4.4 ,
5.2, 10.3 and
11.1

Land use and environmental data were collected and mapped at a 1:50,000 scale (for the corridor/study area phase) and a 1:15,000 scale (for the route/sites phase), according to the following factor categories:

Agricultural Resources

- Appearance of the Landscape
- Biological Resources
- Forest Resources
- Heritage Resources
- Human Settlement
- Mineral Resources
- Recreation Resources
- Engineering/Cost Constraints

This environmental information was used to identify alternative transmission corridors and alternative routes/sites and to evaluate, compare and select the recommended route and sites.

2.4 Socio-Economic Considerations and Public Guidelines

Volume III
Sections 4.2, 4.3, 5.2, 6.1, Appendix B6, and Appendix C

Socio-economic considerations included:

- the capability of the people in the study area to handle change;
- the compatibility of transmission lines with the nature of the community;
- the economic base change associated with transmission lines; and
- the qualitative changes, real or perceived, which could occur when transmission lines are built.

The most often stated public guidelines were:

- follow existing Ontario Hydro rights of way where possible;
- consider consolidation with or upgrading of existing lines where possible;
- minimize the effects on homes, buildings, and developed areas; and
- minimize the effects on agricultural and natural areas.

These guidelines were used in the evaluation and comparison of the alternative routes.

2.5 Technical and Economic Considerations

Volume III
Sections 5.2, 6.1 and 6.2

2.5.1 Technical Considerations

Volume I
Section 7.1

Various tower types were investigated as outlined in Section 4.3. Also considered was the extent to which 500 kV transmission lines and microwave radio facilities affect the operation of facilities such as communications systems, licensed airports, and existing linear facilities.

2.5.2 Economic Considerations

The main factors affecting the cost of a transmission line are usually the length of the line, the type of tower used and the number of line angles or turns. Other factors considered in the identification and evaluation of alternative routes are the cost of property rights, right of way cutting, soil conditions, access, and mitigation measures.

The approximate cost of constructing one kilometre of single circuit 500 kV line is $504,000. This assumes stable soil conditions and a typical mix of suspension and angle towers.

For system comparisons, the economic analysis of alternatives was based on a comparison of the present worth of the annual cash flows and accounts for the time related aspects of capital expenditures.

3.0 TRANSMISSION CORRIDOR AND TELECOMMUNICATIONS STUDY AREA IDENTIFICATION

Volume III
Chapters 4.0
and 10.0

The identification of corridors and telecommunications study areas was designed to reduce the size of the initial study area by eliminating higher constraint areas and retaining the potentially more acceptable areas for the facilities for further examination.

A corridor is a continuous linear area generally located through areas of relatively low constraint, where it is more probable that transmission line routes could be located with the least effect to the overall environment. Similarly, a telecommunications study area is an area where it is more probable that microwave radio station sites could be located with least effect to the overall environment.

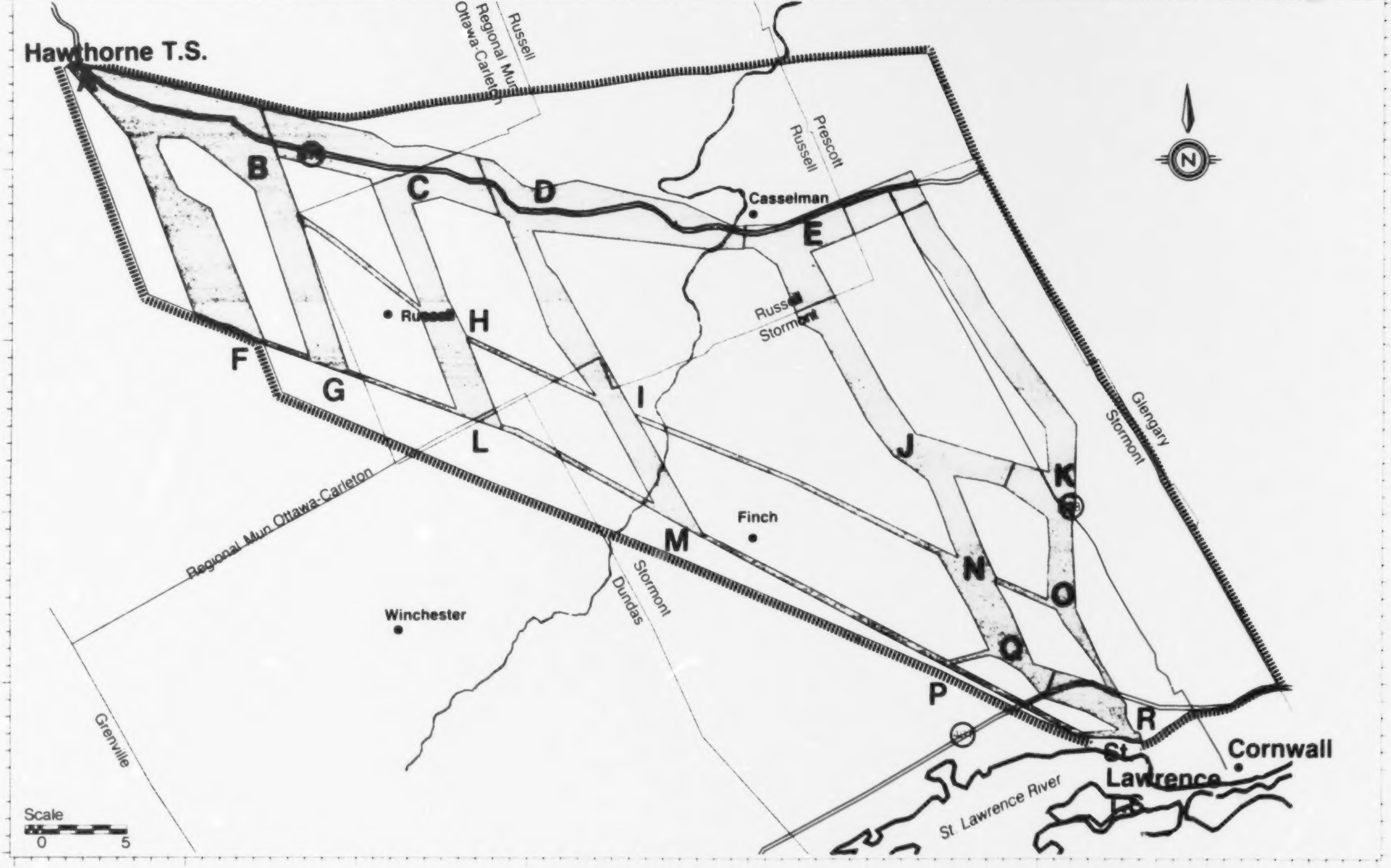
Ontario Hydro developed a series of environmental objectives which were given a resource value rating and a possible effects rating by the Regional Committee. An overall rating for each objective was determined and endorsed by the Regional Committee.

From this information, a constraint map was prepared and used to locate the alternative transmission corridors.

Volume III
Appendix D

The study area was developed to extend the existing microwave telecommunications system from Hawthorne TS to St. Lawrence TS. The study area was determined by first selecting a technically acceptable zone and then applying environmental and technical criteria to reduce the zone to a study area with well defined boundaries.

Alternative transmission line corridors are shown in Figure 3.1. The telecommunications study area is identified in Figure 3.2.


Hawthorne T.S.
Russell
Regional Mun
Ottawa-Carleton
Prescott
Russell
Casselman
Russell
Stormont
Glengary
Stormont
Russell
Finch
Winchester
Regional Mun Ottawa-Carleton
Stormont
Dundas
Grenville
St. Lawrence River
St. Lawrence T.S.
Cornwall
B
C
D
E
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G
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I
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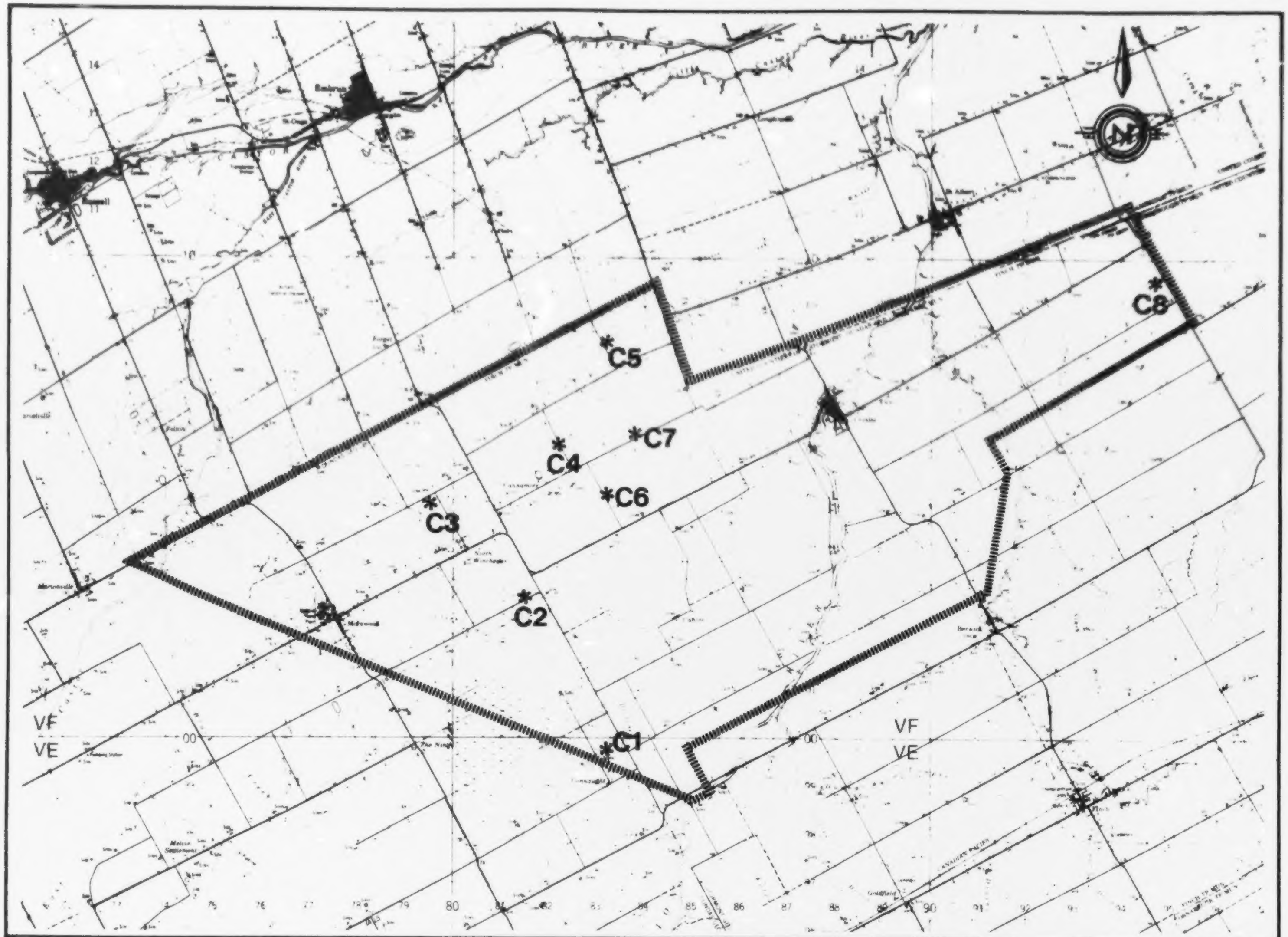
Figure 3.1
Alternative Corridors

Legend

▮▮▮▮▮▮▮▮	Study Area Boundary
T.S.	Transformer Station
▭	Alternative Corridors

Aug 1984 Rev 1 RS170-LUEP-RX3-0050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C7
C4
C6
C3
C2
C1
C8
VF
VE
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VF
VE
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77
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Figure 3.2
Telecommunications Study Area

Legend:

▨ Study Area Boundary
* Alternative Site

Miles 1 0 1
Metres 1000 0 1000

RS-170-LUEP-RA6-0

4.0 RECOMMENDED ROUTE AND SITES

4.1 Identification of Alternative Routes and Sites

Volume III
Chapters 5.0
and 11.0

The next step in the planning process involved the identification of alternative transmission routes and telecommunications sites. These alternatives represented the most suitable locations within the corridors and the telecommunications study area for the required facilities. The alternative routes represent rights of way approximately 65 metres wide, and the alternative telecommunications sites are approximately 0.2 ha in area.

The types of information collected and mapped were similar to those used to identify corridors but, because of the smaller scale, the information was more refined and detailed. Some corridors that were considered less desirable in terms of their environmental, technical, economic and social implications were dropped from further study. Preliminary route alternatives were identified by Ontario Hydro and reviewed by the Regional Committee and the public. The resulting alternative routes and sites are illustrated on the 1:250,000 scale map in Appendix B.

4.2 Evaluation and Comparison of Alternative Routes and Sites

Volume III
Chapters 6.0
and 12.0

The route and site identification process resulted in a number of possible routes and sites being identified. These were evaluated on the basis of land use and environmental, social, economic and technical considerations.

For the land use and environmental analysis, quantitative data were augmented with qualitative comments. Each route and site was then analyzed to determine its potential effects.

Economic and technical considerations included costs, construction implications, and effects on other utilities, transportation and communication facilities.

Each route was also evaluated according to the previously listed socio-economic considerations and public guidelines.

The method of selection of the recommended route involved evaluation, comparison and selection of a preferred sub-route in each of three areas (see Figure 4.1). These areas were as follows:

- the Ottawa area;
- the Cornwall area; and
- the Casselman to Cornwall area.

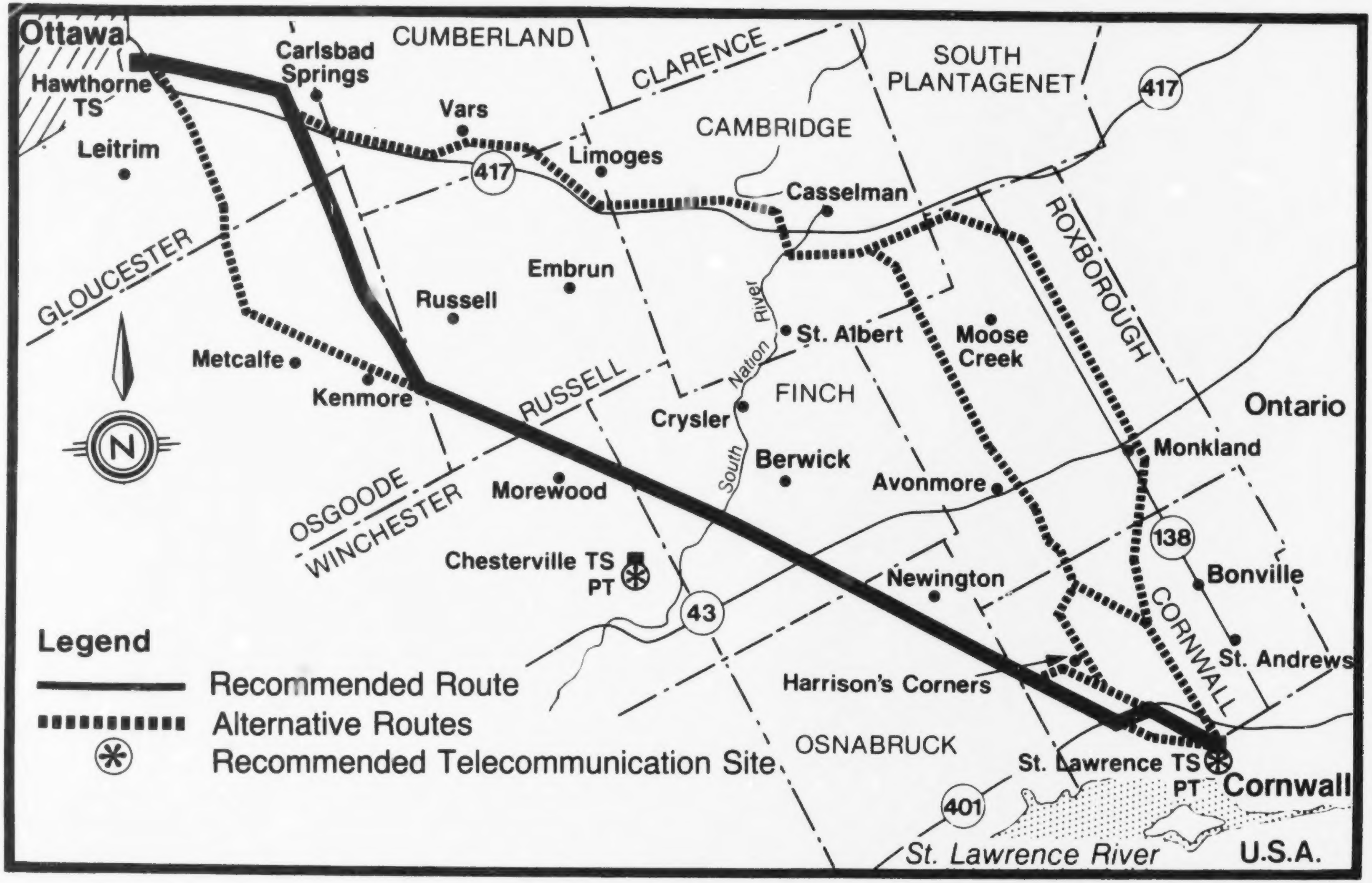

Ottawa
Hawthorne TS
Leitrim
Carlsbad Springs
CUMBERLAND
CLARENCE
SOUTH PLANTAGENET
417
Vars
Limoges
417
CAMBRIDGE
Casselman
GLOUCESTER
Embrun
Russell
Metcalfe
Kenmore
St. Albert
Nation River
Moose Creek
ROXBOROUGH
RUSSELL
FINCH
Crysler
Ontario
Monkland
South
Berwick
Avonmore
OSGOODE
WINCHESTER
Morewood
Chesterville TS
PT
138
Bonville
CORNWALL
Newington
43
St. Andrews
Legend
Recommended Route
Alternative Routes
Recommended Telecommunication Site
Harrison's Corners
OSNABRUCK
St. Lawrence TS
PT
Cornwall
401
St. Lawrence River
U.S.A.

Figure 4.1
Recommended Route and Alternative Routes

After the preferred sub-route was selected in each of these three areas the route alternatives were reduced to two routes for the final route evaluation and comparison. These final route alternatives were referred to as:

- the Highway 417 Route; and
- the 115 kV Transmission Line Route.

For the telecommunications site study, eight alternative sites were identified in the study area shown on Figure 3.2. The sites were evaluated and compared to select the recommended site in the study area. The site at St. Lawrence TS was fixed by technical requirements.

4.3 Selection of the Recommended Route and Sites

Volume III
Chapters 7.0
and 13.0

4.3.1 Selection Rationale - Transmission

The results of the evaluation and comparison indicated that the 115 kV transmission line route would have relatively low potential effects on most land use, environmental and socio-economic factors and be the least expensive to construct.

The major reasons for selection of the 115 kV transmission line route, over the Highway 417 route, are as follows:

- least cost and most direct route;
- least overall effect on active agricultural land;
- least effect on the forest resources;
- least effect on biological resources;
- least visual effects;
- least effect on the heritage resources;
- least effect on areas of aggregate potential;
- least effect on existing and proposed residential areas;
- right of way requirements are reduced and existing severances are used;
- low socio-economic effects; and
- adheres closely to guidelines provided by the public.

4.3.2 Recommended Route

Volume III
Section 7.1

The recommended route is illustrated in Appendix B and is described as follows:

- Hawthorne TS to Point B

  The route (10.5 km of new right of way) follows the south side of the CN railway through agricultural land under lease from the National Capital Commission. The long parallel of the railway (approximately 9 kilometres) will involve remedial costs to correct interference with the CN and Bell Canada communications facilities. The right of way required is approximately 65 m wide.

- Point B to Point G

  The route (16.4 kilometres of new right of way) crosses through a mixture of active agricultural land and forest. The majority of the route is located along either lot boundaries or at the mid-concession line in the active agricultural land. The right of way required is approximately 65 m wide.

- Point G to Point P

  The route uses an existing 115 kV transmission line right of way for 39.1 kilometres. The existing line, which is on a 30 m wide easement, will be removed and the single circuit 500 kV line built in its place. The existing easement agreement must be renegotiated and widened for a total right of way width of approximately 65 metres.

- Point P to Point P_1

  A short portion (about 1 kilometre) of the route, between point P and Lunenburg Jct., will involve replacement of the existing 115 kV transmission line as between points G and P. From Lunenburg Jct to point P_1 the route parallels the north side of the existing 115 kV transmission line. The total length of route is 5.2 kilometres through an area of forested land with some active agriculture and small gravel pits. Approximately 47 m additional right of way will be needed beside the existing 30 m wide easement.

- Point P_1 to Point Q_1

  This portion of the route follows the south side of the Highway 401 for 1.3 kilometres through a forested area. The new transmission line does not use any portion of the Highway 401 right of way where it parallels the highway. The right of way required is approximately 65 m wide.

- Point Q_1 to Point R (St. Lawrence TS)

  The route parallels an existing two circuit 230 kV transmission line using part of an Ontario Hydro owned right of way which is 75 metres wide. An additional width of approximately 12 m of right of way will be acquired on the west side for this 5.6 kilometre long route. The proposed route crosses through an area of forested land with some active agriculture and rural residential development.

Typical tower designs are shown schematically in Figure 4.2 and 4.3. With the following exceptions, all suspension structures and angle structures would be conventional four footing lattice towers (Figure 4.2). It is proposed that the narrow base lattice towers (Figure 4.3) would be used for suspension structures located in open cultivated fields of prime farm land where technically feasible, in accordance with criteria established by Ontario Hydro and the Ontario Federation of Agriculture.

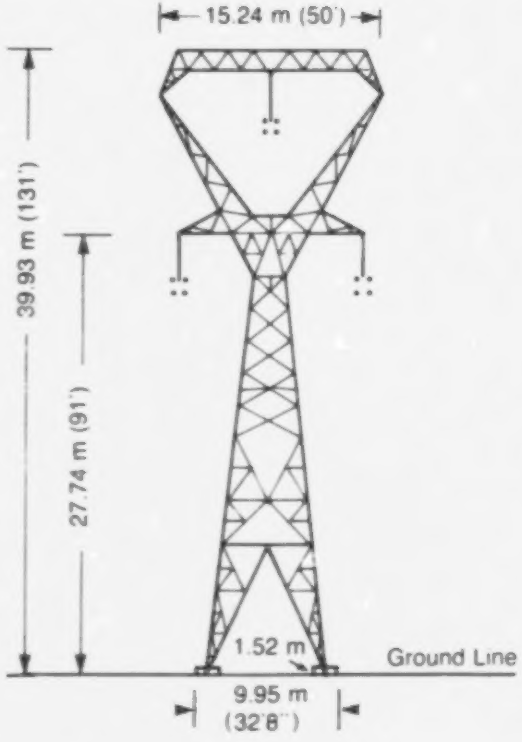

15.24 m (50')
39.93 m (131')
27.74 m (91')
1.52 m
Ground Line
9.95 m
(32'8")

Figure 4.2
500 kV Single Circuit
Conventional Lattice Tower

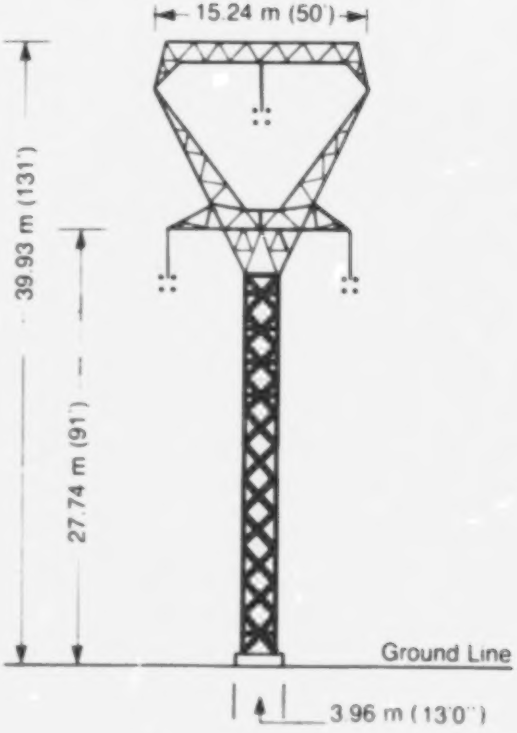

15.24 m (50')
39.93 m (131')
27.74 m (91')
Ground Line
3.96 m (13'0")

Figure 4.3
500 kV Single Circuit
Narrow Base Lattice Tower

RS-170-LUEP-RA6-0050

4.3.3 Selection Rationale - Telecommunications Sites

Volume III
Section 13.1

As a result of the evaluation and comparison process, Chesterville TS was selected as the recommended site for the following reasons:

- located on Ontario Hydro property;
- relatively low cost;
- power supply on site;
- excellent site conditions;
- no removal of trees or shrubs required; and
- relatively lower potential visual effect due to the lowest number of residences and towns and villages within a 5 km radius.

No alternatives were considered to the site at St. Lawrence TS because the facilities are technically required at this location. This site has the advantage of being in an industrial area with few residents in the immediate vicinity.

The locations of the recommended sites are shown in Appendix B.

5.0 MITIGATION OF EFFECTS

Volume III
Sections 7.1,
13.2, and
Appendix B9

Environmental changes or effects would result from the construction of a 500 kV transmission line and associated telecommunications facilities. Ontario Hydro would endeavor to minimize the extent and duration of these effects through the application of appropriate mitigation, and restoration measures. These measures would be applied in accordance with Ontario Hydro's "Construction and Site Restoration Guidelines for Transmission Facilities, March 1981", approved by the Minister of the Environment. These include a broad range of mitigation, restoration and/or compensation measures which would be applied as necessary and appropriate. Specific mitigation procedures would be developed in the course of final route design and tower placement.

6.0 RELATED ONTARIO HYDRO STUDIES AND REPORTS

(i) Eastern Ontario Transmission Plan Stage Environmental Assessment, July 1980.

(ii) Construction and Site Restoration Guidelines for Transmission Facilities, March 1981.

(iii) Eastern Ontario Transmission Line Study - Route Stage, Volume I and Volume II, August 1984.

7.0 POST-APPROVAL ACTIVITIES

Volume III Chapters 8.0 and 14.0

Following approval by the Joint Board, Ontario Hydro would proceed to refine the route location and design the transmission line and telecommunications facilities and determine the specific methods of construction and mitigation. Consultation with directly affected parties would be carried out prior to preparation of final engineering plans and then property acquisition would be undertaken. After possession of the property rights, construction would begin together with environmental monitoring.

APPENDIX A

List of the Locations of the Document Repositories

A1	Location of Map and Document Repositories
A2	Location of Repositories for Exhibits and Other Hearings Record Documents
A3	Locations of Document Repositories at Ontario Hydro Offices

APPENDIX A1

Locations of Map and Document Repositories

Municipal Offices

UNITED COUNTIES	MAILING ADDRESS
Stormont, Dundas & Glengarry	20 Pitt Street Cornwall, Ontario K6J 3P2
CITY	
Cornwall	PO Box 877 360 Pitt Street Cornwall, Ontario K6H 5T9
TOWNSHIPS	
Cornwall	RR #1 Long Sault, Ontario K0C 1P0
Finch	PO Box 99 Victoria & Beaver Streets Berwick, Ontario K0C 1G0
Osnabruck	PO Box 340 Ingleside, Ontario K0C 1M0
Roxborough	PO Box 189 Moose Creek, Ontario K0C 1W0
Winchester	PO Box 40 Morewood, Ontario K0A 2R0
REGIONAL MUNICIPALITY	
Ottawa-Carleton	222 Queen Street Ottawa, Ontario K1P 5Z3

CITY	MAILING ADDRESS
Gloucester	PO Box 8333 4550 Bank Street Gloucester, Ontario K1G 3V5
Ottawa	111 Sussex Drive Ottawa, Ontario K1N 5A1
TOWNSHIPS	
Cumberland	PO Box 15 RR #3 Navan, Ontario K0A 2S0
Osgoode	PO Box 130 Victoria Street Metcalfe, Ontario K0A 2P0
UNITED COUNTIES	
Prescott & Russell	PO Box 304 Court Street L'Original, Ontario K0B 1K0
VILLAGE	
Casselman	PO Box 180 23 St. Isidore Road Casselman, Ontario K0A 1M0
TOWNSHIPS	
Cambridge	PO Box 86 St. Albert, Ontario k0A 3C0
Russell	PO Box 570 668 Norte Dame Street Embrun, Ontario K0A 1W0
South Plantagenet	PO Box 10 Fournier, Ontario K0B 1G0

PUBLIC LIBRARIES

Avonmore Branch
Stormont, Dundas & Glengarry
County Public Library Board
Avonmore, Ontario
K0C 1C0

Casselman Public Library Board
rue Dollard
Casselman, Ontario
K0A 1M0

Cumberland Township Public Library Board
PO Box 239
Ecole Richard
Regional Road 28
Navan, Ontario
K0A 2S0

Gloucester Public Library Board
2721 Bank Street
Gloucester, Ontario
K1T 1N1

Long Sault Branch
Stormont, Dundas & Glengarry County Public Library Board
Long Sault, Ontario
K0C 1P0

Newington Branch
Stormont, Dundas & Glengarry County Public Library Board
Newington, Ontario
K0C 1Y0

Russell Township Public Library Board
PO Box 280
472 Concession Street
Russell, Ontario

Stormont, Dundas & Glengarry County Public Library Board
PO Box 939
150 Edward Street
Cornwall, Ontario
K6H 5V1

Cambridge Township Public Library Board
PO Box 99
St. Albert, Ontario
K0A 3C0

Chesterville Branch
Stormont, Dundas & Glengarry County Public Library Board
Chesterville, Ontario
K0C 1H0

Finch Branch
Stormont, Dundas & Glengarry County Public Library Board
Finch, Ontario
K0C 1K0

Limoges Branch
Cambridge Township Public Library Board
PO Box 70
Limoges, Ontario
K0A 2M0

Metcalfe Branch
Osgoode Township Public Library Board
PO Box 299
Metcalfe, Ontario
K0A 2P0

Ottawa Public Library Board
120 Metcalfe Street
Ottawa, Ontario
K1P 5M2

St. Andrews West Branch
Stormont, Dundas & Glengarry County Public Library Board
St. Andrew, Ontario
K0C 2A0

APPENDIX A2

Repositories for Transcripts, Exhibits and other Hearings Record Documents

(1) Ottawa

Ottawa Public Library
120 Metcalfe Street
Ottawa, Ontario

(2) Cornwall

Stormont, Dundas & Glengarry County Library
150 Edward Street
Cornwall, Ontario
K6H 5V1

APPENDIX A3

Document Repositories

Ontario Hydro Offices

Head Office
700 University Avenue
Toronto, Ontario
M5G 1X6

Eastern Regional Office
420 Dundas Street East
Belleville, Ontario
K8N 5C3

Ottawa District Office
106 Colonnade Road North
Suite 210
Nepean, Ontario
K2E 7L6

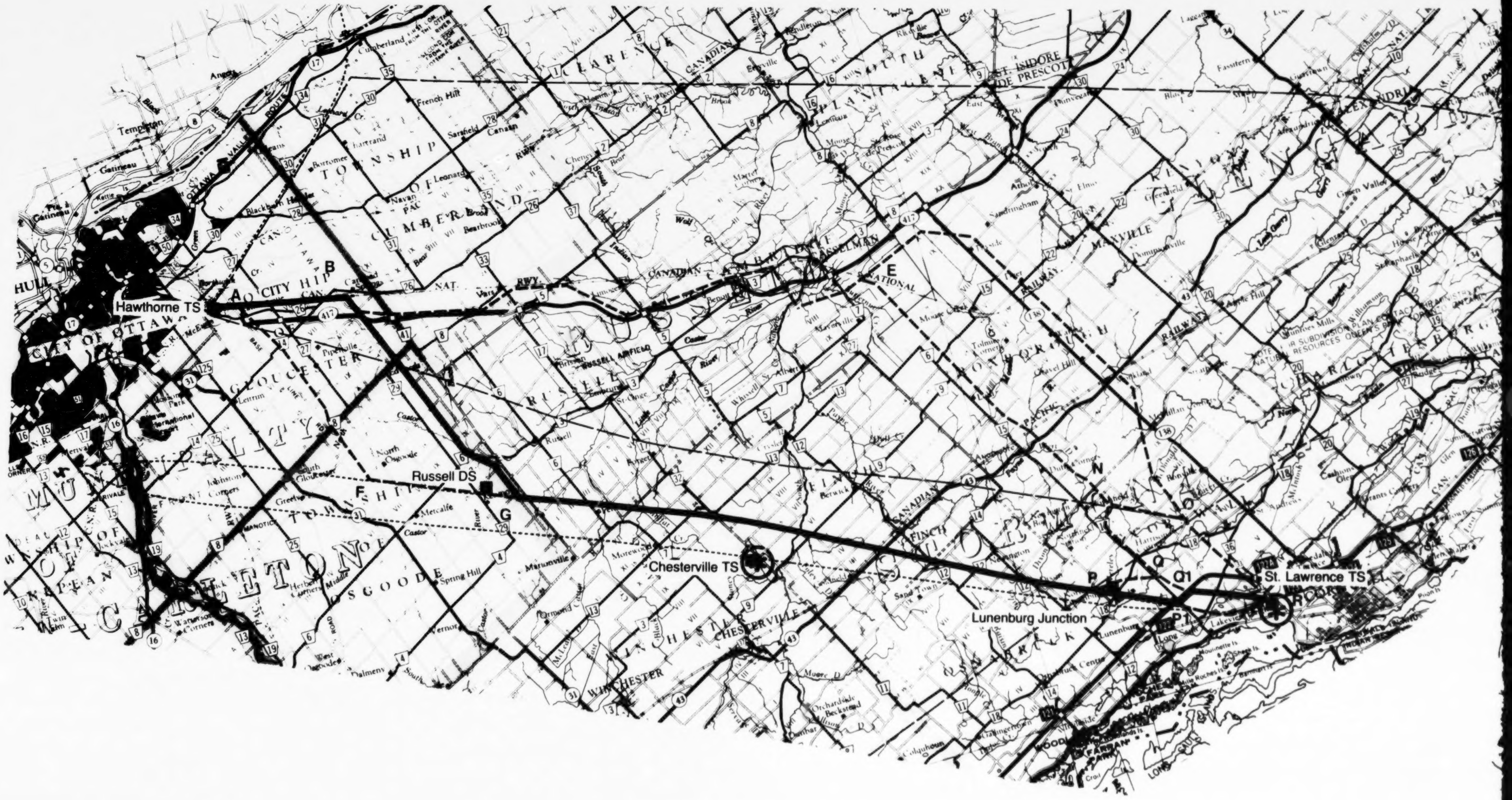
Winchester Area Office
PO Box 360
St. Lawrence Street
Winchester, Ontario
K0C 2K0

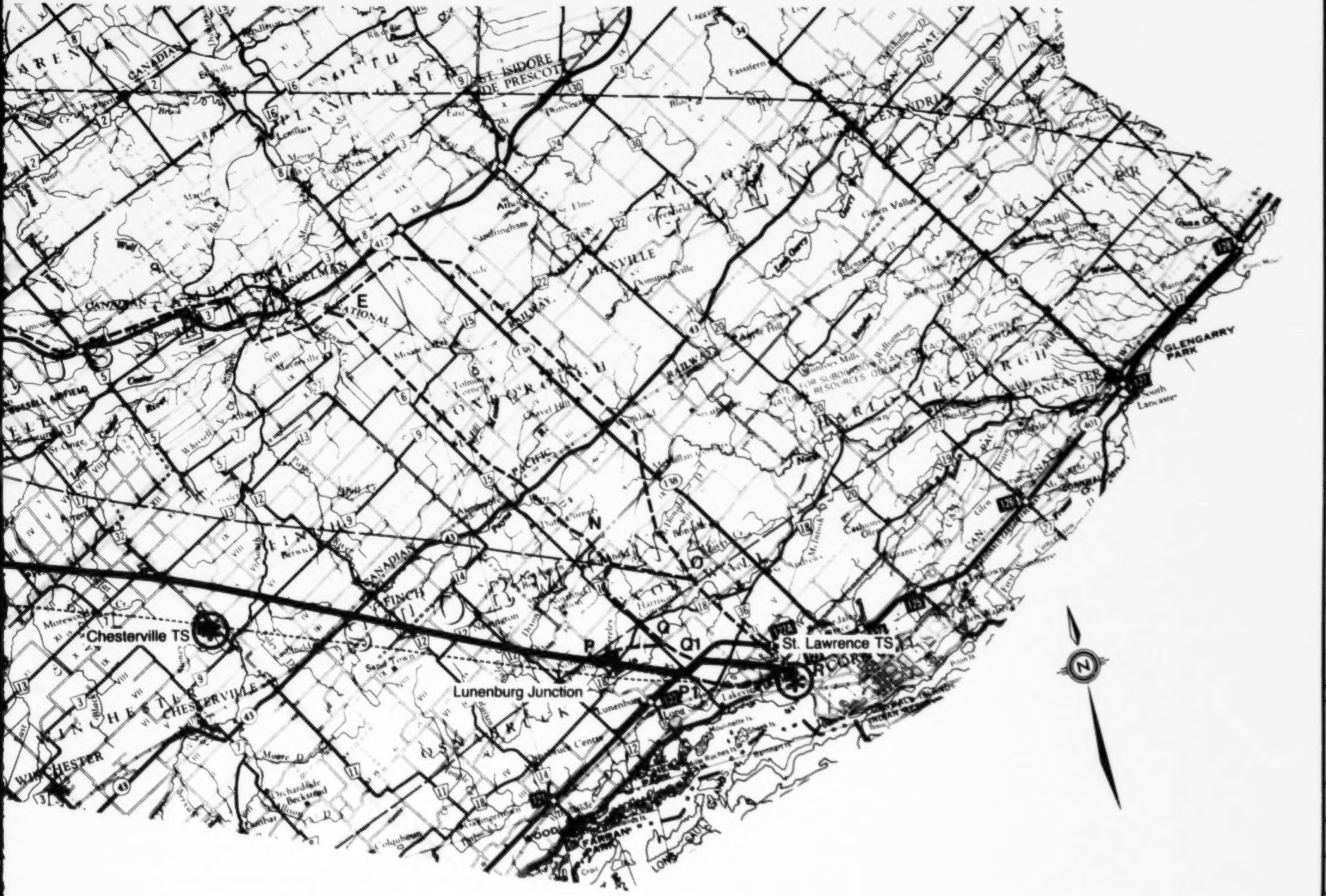
Vankleek Hill Area Office
PO Box 250
Queen Street
Vankleek Hill, Ontario
K0B 1R0

Cornwall District Office
(R.H. Saunders GS)
PO Box 999
Cornwall, Ontario
K6H 5Z1

APPENDIX B

1:250,000 Map of Recommended Route and Sites


Hawthorne TS
A
B
E
Russell DS
F
G
N
O
Chesterville TS
Q
Q1
P
P1
Lunenburg Junction
St. Lawrence TS
CITY OF OTTAWA
HULL
GLOUCESTER
CUMBERLAND
RUSSELL
OSGOODE
CARLETON
NEPEAN
CHESTERVILLE
WINCHESTER
FINCH
MAXVILLE
CASSELMAN
ST. ISIDORE DE PRESCOTT
ALEXANDRIA


ST. ISIDORE DE PRESCOTT
CASSELMAN
MAXVILLE
ALEXANDRIA
LANCASTER
GLENGARRY PARK
FINCH
CHESTERVILLE
WINCHESTER
E
N
O
P
Q
Q1
P1
Chesterville TS
St. Lawrence TS
Lunenburg Junction
CORNWALL
N

Appendix B
Recommended Routes and Sites

Legend

— —	Existing 230 kV Line
---------	Existing 115 kV Line
■	Transformer Station TS
– – – –	Alternative Routes
A	Route Intersection
━━━	Recommended Route
⊛	Recommended Telecommunication Site

Note: Alternative routes and sites are not drawn to scale
All boundaries are approximate.

MF Roll No	Rev	Date	Particulars	Drawn	App'd

Ontario Hydro
Design and Development Division
–Transmission

Drawn by	Supervising Planner
Date March 1985	Supervising Project Engineer
Work Order 840 03016	Graphics Prod. Supervisor D. Henderson

Scale	Drawing No	Rev	Sheet
1:250,000	RS170-LUEP-RA6-0057	0	1 of 1